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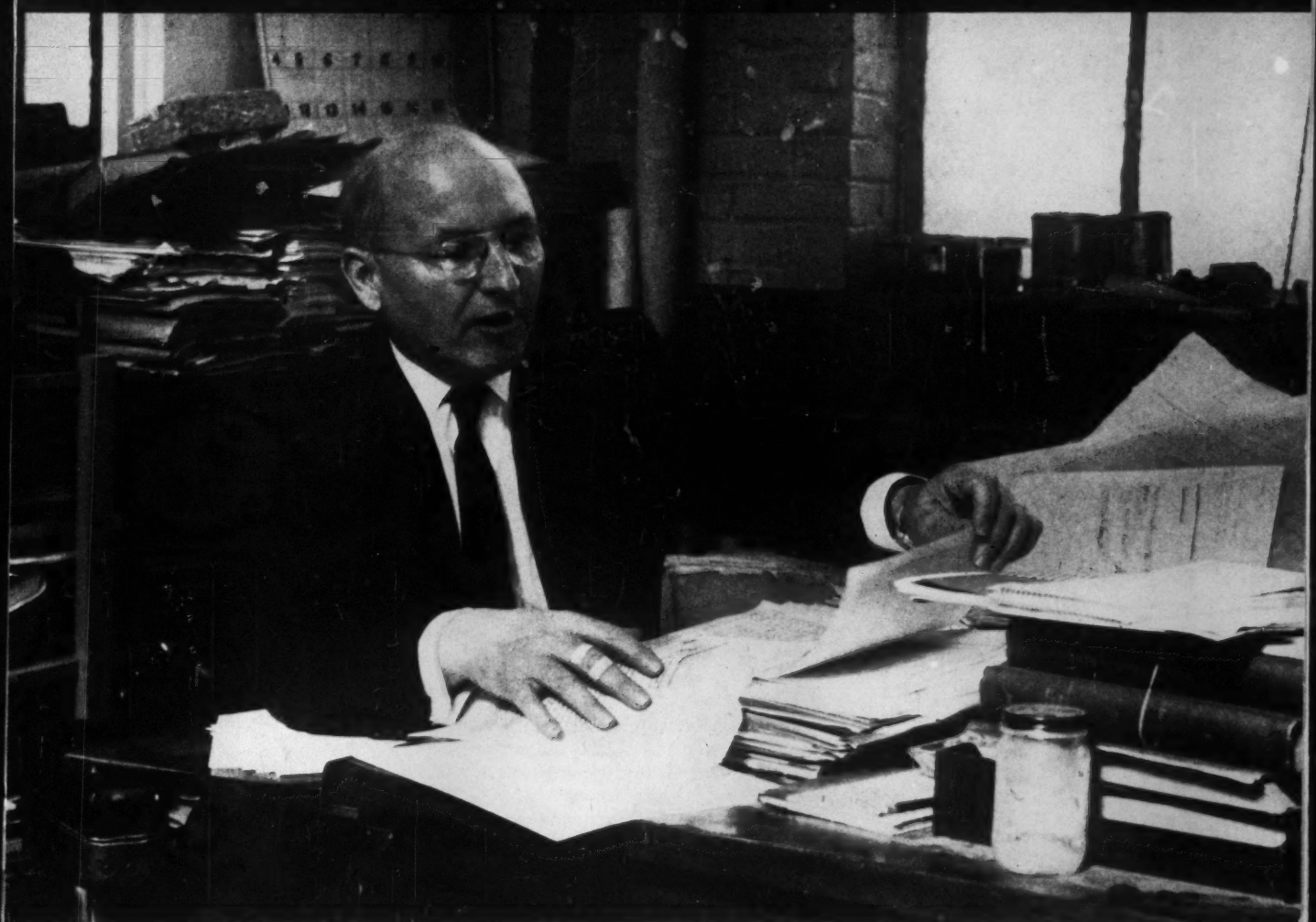

ASTM's Clair: "Standards are an incentive." p.51

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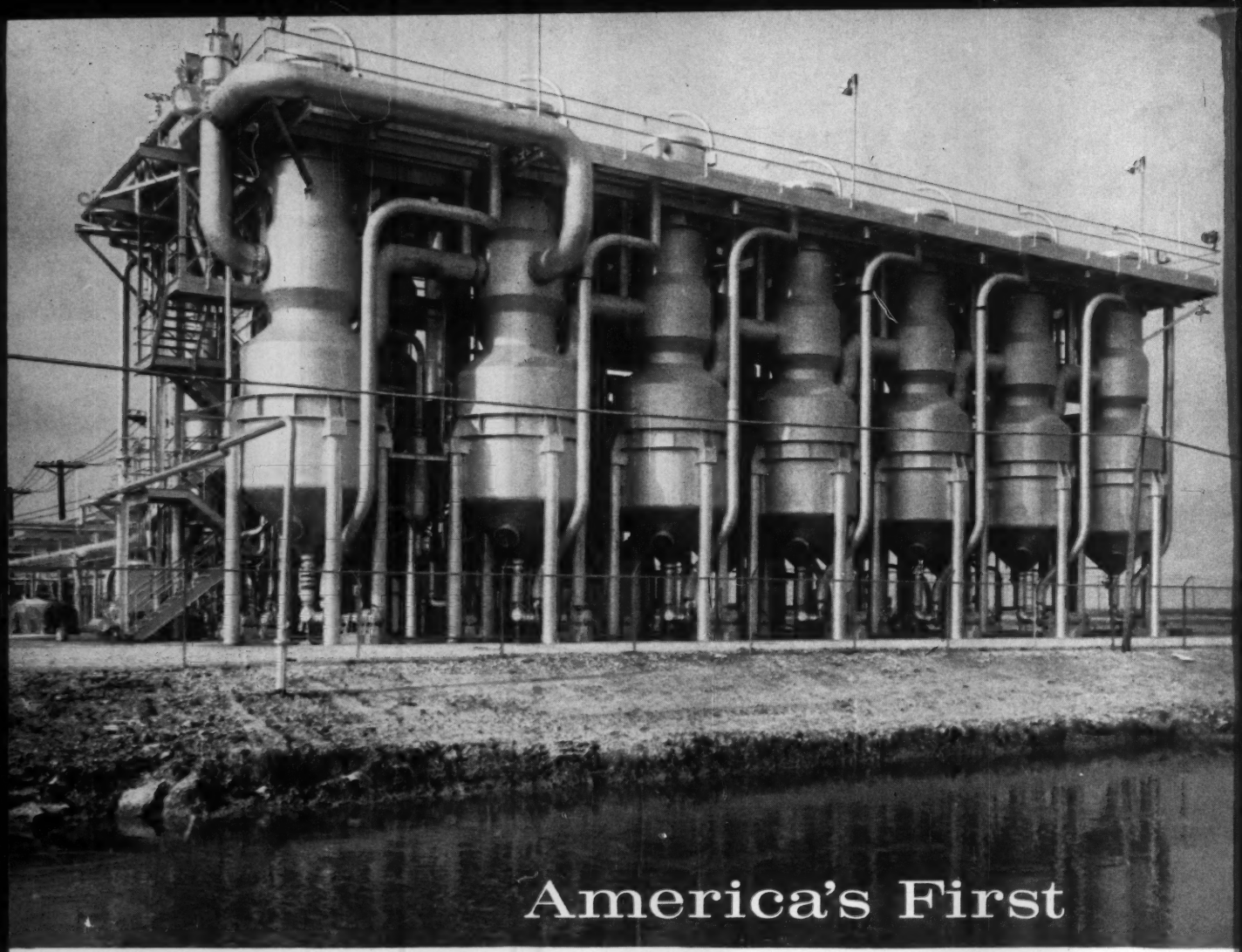

America's First Experimental Seawater Conversion Plant

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The steady decline of available fresh water may well find economical solution through this new experimental saline water conversion plant. It's America's first installation.

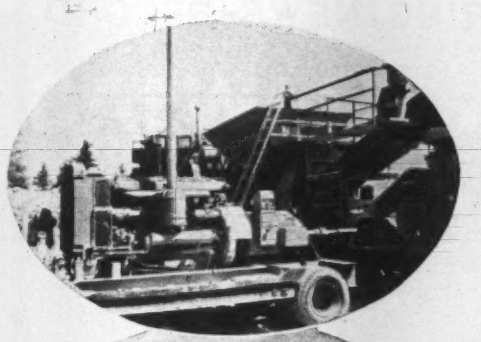
Built by CB&I for the Office of Saline Water, U. S. Dept. of Interior, it is capable of producing 1,000,000 gallons of fresh water daily from the salty Gulf of Mexico at Freeport, Texas. The facility is expected to produce this volume for less than $1 per thousand gallons.

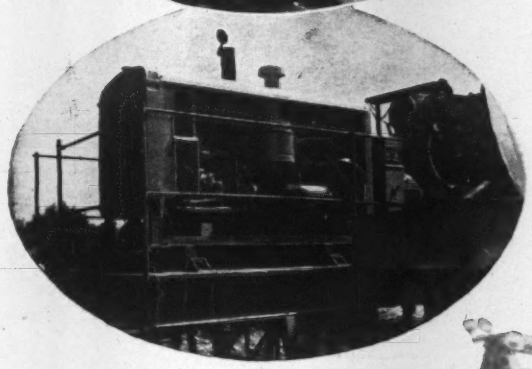
Valuable operating information, including methods of combating corrosion and scale formation, will be provided for future and larger installations to follow.

CB&I completed the design, fabrication and erection of the steel structure in less than a year. This included an 8-day test run.

To learn how CB&I's extensive experience with process design, fabrication and erection in many fields can be advantageously applied to your plant problems, write to Chicago Bridge & Iron Company, 332 South Michigan Avenue, Chicago 4, Illinois. Offices and subsidiaries are located throughout the world.

CB&I **built it!**





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ELECTRIC POWER

Murphy Diesel Mech-Elec Unit (upper left) supplies electric and mechanical power simultaneously or separately for a portable aggregate plant in the East.

Murphy Diesel Generator Set (left) provides inexpensive dependable electric power for a portable asphalt plant in New Hampshire.

Murphy Diesel Generator Set (below) reduces power-plant maintenance costs on an all-electric scalping plant in South Dakota. A 121 KW Murphy powers the plant.

Whatever *your* job, Murphy Diesels' economical operation and dependability for heavy-duty service keep costs low and profits high. Ask your Murphy Diesel Dealer about the advantages of Murphy Power for your plant.

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MP Series Murphy Diesel engines and power units are available in sizes from 105 to 420 HP with engine speeds of 1200 and 1400 rpm. "Packaged" generating units are available with capacities ranging from 70 to 227 K.W.

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Fastest in 30 Yrs

Symons steel-ply forms provide record forming speed on big motel job

Ludwig Zahn, contractor on the new Holiday Inn, Mansfield, Ohio, reports the Symons Forming System provided faster pouring and stripping than any he has used during his 30 years in construction.

Particularly important was the king-stringer method which the contractor and the Symons engineering department devised to form the deck of the structure. King-stringers constructed of 2 x 4's bolted to 2 x 10's were 8 ft. on center. In between this were 4 x 4's supported by shores. Regular

View from "down under" showing stripping procedure. Note work space available with this type of slab system.

4-foot panels were then laid on the stringers and tied together with a Symons bolt and wedge in the center of each panel. To strip, they simply removed the 4 x 4 with its shoring and pulled down the panels. The stringer was left in position as support shoring for the required length of time.

For the *complete story, write us.* Symons forms are rented with purchase option.

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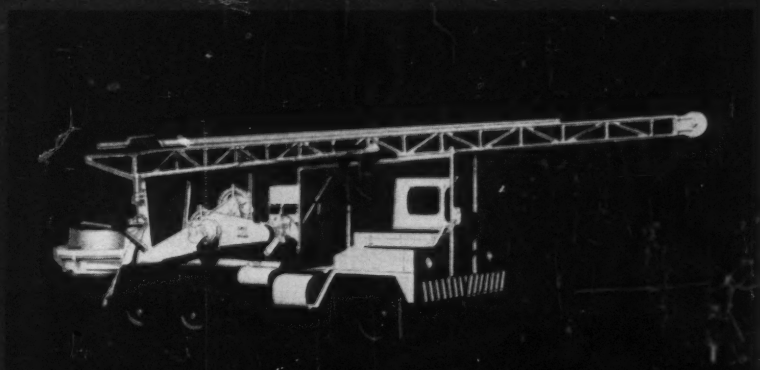
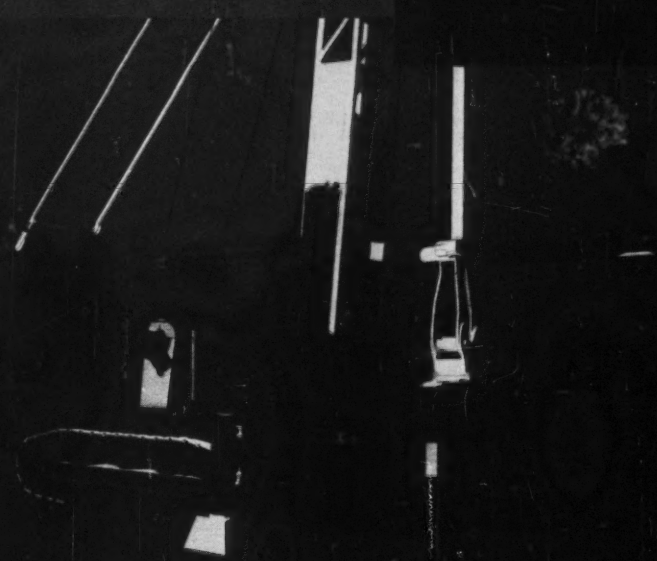
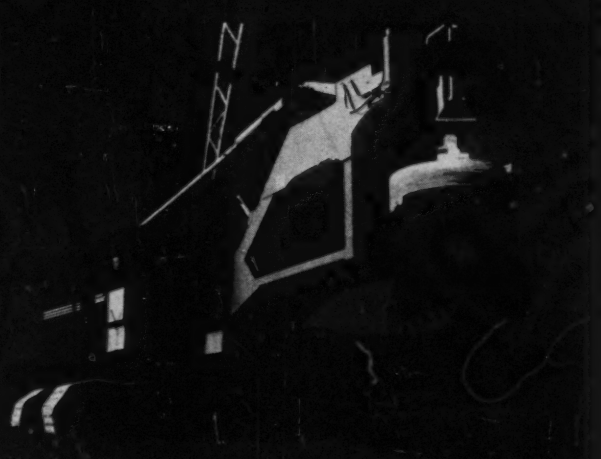
Completely mobile, highly maneuverable Calweld Drills travel from one job to the next at highway speeds. 60 per hour digging speed makes fast work of the toughest drilling jobs. Centralized controls and a hydraulic dumping arm enable the driller to handle the entire operation. Three models are available for mounting on any commercial truck chassis — two tons or over. Gasoline or diesel power is optional on all Calweld Drills.





TRACTOR MOUNTED

Self-propelled Model 500-C Calweld Drill



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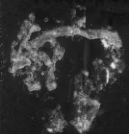
Your crane can do extra duty as a high-speed, big capacity earth auger... and vice versa. Calweld Drills mount on any crawler or truck-mounted crane. Less than an hour is all it takes. Easily operated by one crane man, Calweld Drills dig clean, straight holes — never any manual digging or finishing. Series 150-C drill mounts on any 1½-yard crane. Series 100-C is for ¾ or 1-yard cranes. A complete line of Calweld bucket drills is available for all types of digging.



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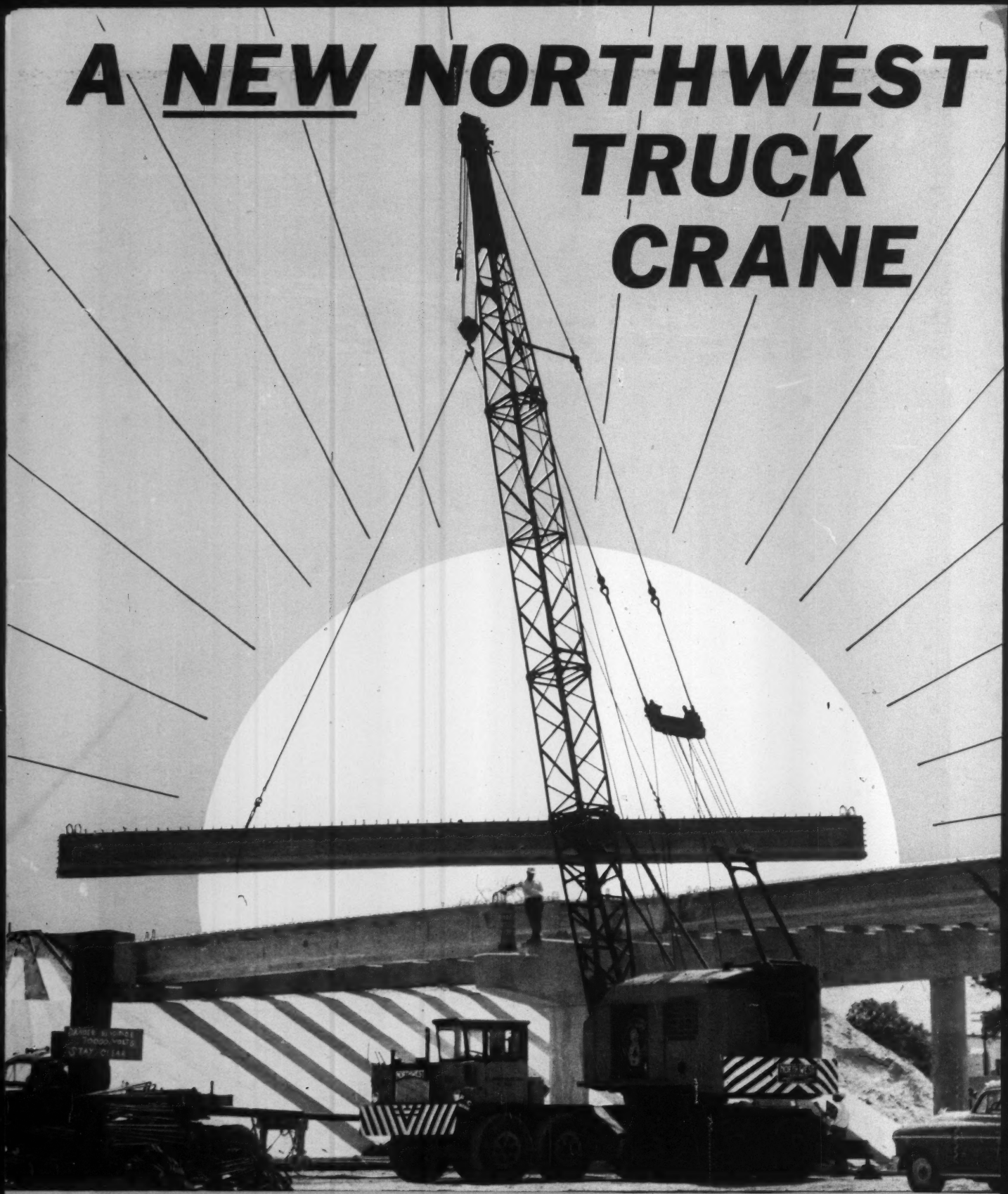
CALWELD DRILLS

A NEW NORTHWEST TRUCK CRANE



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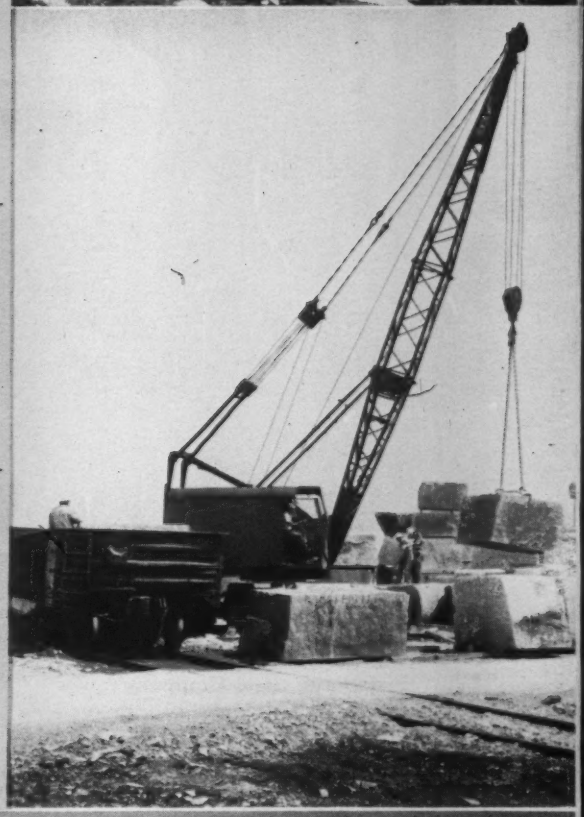
With a Combination of ADVANTAGES that only NORTHWEST Can Bring You!



These 45-ton Northwest Truck Cranes are in the field—at work—have proved their ability! They get the job done! They bring qualities you want! Rugged, cast steel bases—smoothness of control never before found in a Truck Crane of this capacity from the feel of the load at the hook to the real feel of the swing that comes with the oversize, easily operated, disc-type Uniform Pressure Swing Clutches.

Rugged, really smooth, dependable, Independent High Speed Boom Hoist—controlled power *up or down*—True Power Load Lowering . . . a 3rd Drum of real capacity, not a toy . . . Torque Converters, if desired; Screw Jacks or Hydraulic Jacks capable of variable adjustment with aluminum floats . . . Removable Counterweight . . . Remote Control for the carrier!

There are Flange or Pin-Connected Booms, Sectional Jibs and a host of advanced carrier advantages that will interest you. There is a new catalog on this machine to tell you the story. Ask for it.

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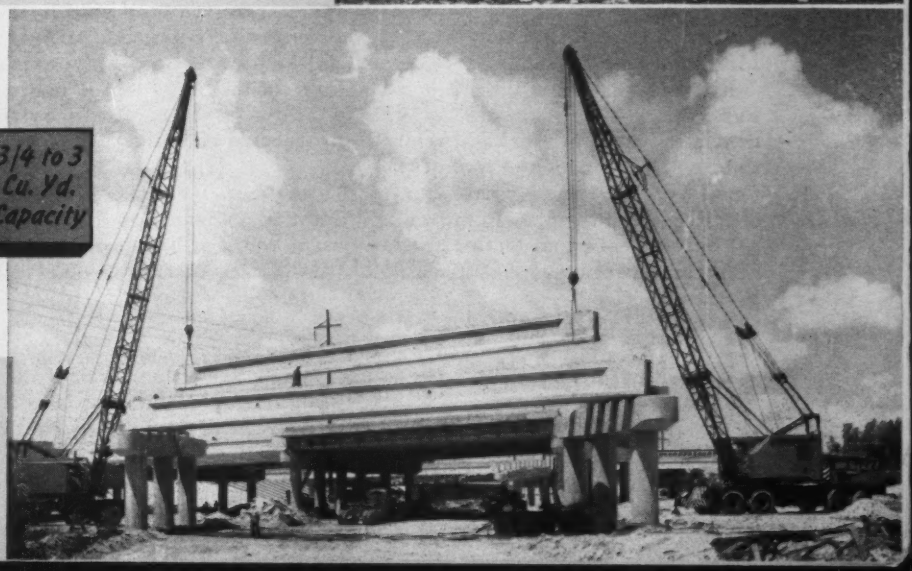
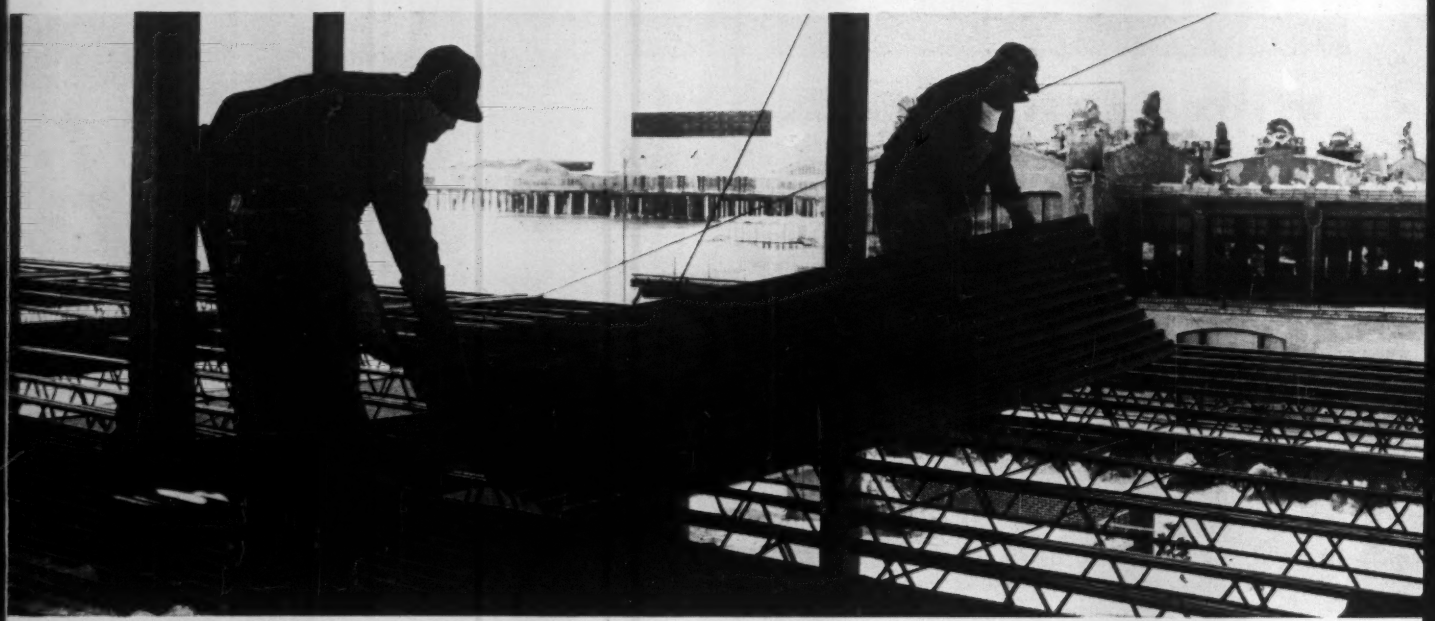


FIELD

During Atlantic City's Worst Winter . . .

Coated Fab-Form Stops Salt Damage on Beachfront Hotel Job



Special Bonderized, baked-on red oxide coating on Pittsburgh Steel Company's Fab-Form "27" provided full protection against unusual corrosive conditions during winter construction of new four-story addition to the Marlborough-Blenheim Hotel, Atlantic City, N.J. Lengths from 6 feet 3 inches to 28 feet 3 inches were engineered to layout for faster, easier installation.

Pittsburgh Steel Company's new Coated Fab-Form "27" proved invulnerable to severe salt and weather conditions during winter construction of a modern new addition to one of Atlantic City's best-known Boardwalk hotels—the Marlborough-Blenheim.

Fifty thousand square feet of Fab-Form were installed as permanent steel centering for lightweight slabs on three floors and roof of the four-story, 77-unit wing that fronts at the center of the busy Boardwalk.

The problem of protecting materials from corrosion was complicated by these factors:

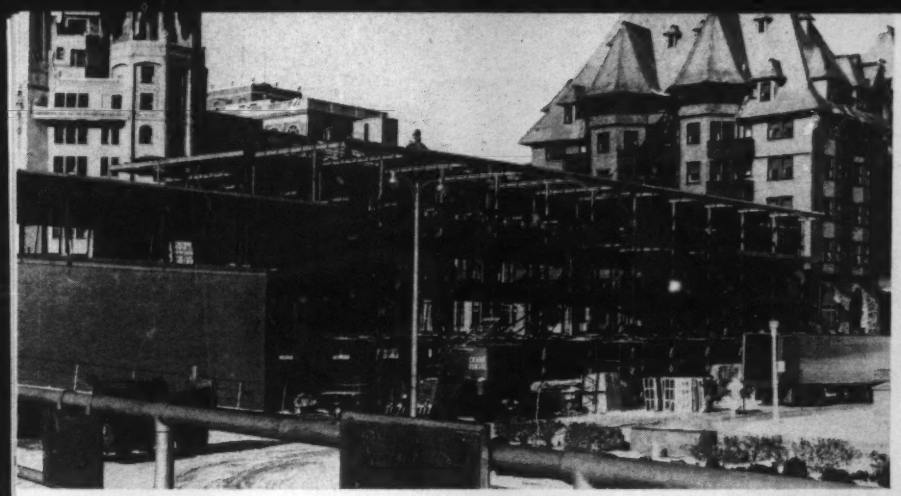
- Salty atmosphere of a beachfront site
- Addition of freeze inhibitor to wet concrete
- Exposure to weather elements when the worst winter on record delayed construction.

But the effects of exposure, corrosive additives and salt spray were stopped cold by Fab-Form's special Bonderized, baked-on red oxide coating—and at less cost than ordinary corrugated steel forms with a protective coating.

- **Other Benefits**—There are additional advantages for Fab-Form users, too. For instance, it's:
  - Wider—32-inch cover width
  - Longer—sheets up to 28 feet, 3 inches
  - Heavier—27 gage steel

Here's how the builders of the Marlborough-Blenheim addition rate advantages of Fab-Form "27."

- **Architect** Stephen B. Hazzard, AIA, of Warrington, Pa.: "I approved Fab-Form because it saved money. And I knew that with Coated Fab-Form there was no decrease—if not a distinct increase—in quality."
- **Construction Supt.** Joseph R. Daly of R.A. Prendergast & Son, Atlantic City: "The Fab-Form coating provides all the protection we need against the anti-freeze-waterproofing additive we mixed with the concrete. It doesn't set up a foaming reaction and doesn't stain. Since it's prepainted, we don't have to apply a field coat before closing in."
- **Installer Foreman** Frank Capano of L&R Steel Construction Co., Haddon Heights, N.J.: "Fab-Form's longer and wider sheets definitely save time. With a four-man



Flanking Brighton Park at the center of the famous Boardwalk, the Marlborough-Blenheim's new 77-unit addition links the well-known resort hotel with shops and beach. Street level space accommodates shops and professional offices. Architect: Stephen B. Hazzard, AIA. Fab-Form distributor: United Steel Products Co., Trenton, N.J.

Installed on roof with special breather vent clips, Coated Fab-Form solved condensation problem, eliminated need of protective field coat on underside. Finished roof is lightweight aggregate, sloped from 4½ inches at edge to 2½ inches at center.

Fab-Form, attached with self-tapping screws over bar joists 24 inches o.c., is checked against floor diagram by Construction Supt. Joseph R. Daly and Installer Foreman Frank Capano before 2½-inch concrete floor is poured.

crew, we can lay about 7,000 square feet a day. The corrugations don't seem to dent like other types of decking and the primer coat doesn't wear off underfoot.

"But what I like best is the Fab-Form color. It's a lot easier on the eyes. The glare from bare metal decking can practically blind a man installing it. At times I've had to wear two pairs of sunglasses to cut down the glare."

Take advantage of Fab-Form's benefits on your next concrete floor or roof project. It's available plain or coated in heavy duty 25 gage or standard 27 gage steel. Ask your independent supplier or contact the nearest Pittsburgh Steel Office listed at the right.

▶ See Sweets Catalog Section 2f

Fab-Form®

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a division of Pittsburgh Steel Company

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Many Flintkote asphalt cutbacks and emulsions are specially designed and field proven for protecting against water, dampness and corrosion, among them:

C-13-E EMULSION: non-fibrated asphalt base clay emulsion protects metal and masonry from weather and corrosive elements.

FLINTKOTE C-19: tough, spray-applied, vapor sealing asphalt cutback for low temperature equipment.

C-13-A EMULSION and THERMALKOTE®: heavily fibrated breathing types of coatings for moisture protection of insulation.

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FLINTMASTIC*: most widely used "work floor" wearing surface. A clay emulsion asphaltic binder for finishing or resurfacing wood or concrete in heavy duty wheel and foot traffic areas. Easy to apply, mixed on the job and trowel finished for quick, light surfacing.

FLINTKOTE LATEX FLOORING: attractive, thin-section topping of worn surfaces by trowel application.

LATEX CONCRETE PATCH: for fast, durable, area repairs. Resists many chemicals.

FLINTKOTE EPOXY FLOORING: toughest, highest grease and chemical resistance for surfacing problem floors. Units comprise resin binder, hardener, premixed filler, complete handling instructions.

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Reader Comment

Delta Is a Winner

SIR—Homer M. Hadley should be congratulated for taking the initiative in promotion and testing of the delta girder section (ENR May 25, p. 27).

If such a profile is used for relatively short spans and in high strength alloys, it will be most economical and efficient; it is truly the shape of the future.

I think it is unfortunate that bridge designers have been using the existing profiles (such as 36-in. WF sections) not only for designs in carbon steel but also in high strength steels. These shapes actually represent column sections with about 40% of the metal in the web, yet they have been used to carry moments.

Such designs have been uneconomical and wasteful, and should not be allowed in high strength alloys.

In 1952 the writer designed a similar shape to satisfy the requirements of continuity and with both flanges symmetrical (double "Y" section). At about the same time, Professor A. Doren (Germany) pointed out the advantages of such a section.

In 1960 Professor Ch. E. L. Massonet recommended this section for high strength beams. Tests confirmed theoretical calculations of performance and economy.

Slide rule computations for the Hadley girder and a 36-in., 160-lb WF section show the moment capacity of the delta girder to be more (825 kip-ft against 810) although the weight is less (143 lb/ft against 160).

Assuming a lateral force against the top flange applied at the center of a 74-ft span, the maximum rotation of center of the WF section is about four times as great as that of the delta shape. The C value (in.^{6}) for delta section is 288,600 against 86,000 for 160-lb WF section. This (and other) calculations show the advantages of a delta section under torsional loads.

EDUARD LUSS
Independence, Mo.

Not Geography, a Typo

SIR—Your geography is mixed up again. In Hungry Contractors (ENR June 8, p. 13) didn't you mean Denver & Rio Grande Western Railroad Co. instead of "Denver & Ohio Grande"?

R. F. MIRICK
Tacoma, Wash.

Editor's Note: Indeed, we did.

Engineering News-Record welcomes expression of opinions from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance. Letters should be addressed Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

WHATEVER THE STEERING PROBLEM

BLOOD BROTHERS U-JOINTS

assure maximum safety, precision steering control

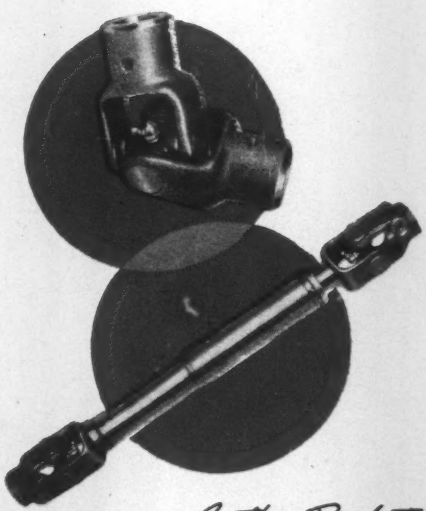
Nearly all major truck manufacturers rely on the ingenuity, ability and established leadership of Rockwell-Standard engineers to provide Blood Brothers universal joints for today's increasingly complex steering assemblies. With each new steering advancement Rockwell-Standard engineers have demonstrated their resourcefulness and skill by supplying dependable, trouble-free universal joints.

For example, the development of power steering and tilt cab trucks introduced the need for more intricate steering shaft assemblies. Rockwell-Standard engineers met the challenge with universal joints capable of transmitting power around corners without any sacrifice in operating performance or steering safety.

PARTICULARLY IMPORTANT IS THE ROCKWELL-STANDARD DEVELOPMENT OF:

- **An anti-backlash universal joint for steering columns that provides greater precision in steering control.**
- **A specially designed machine that tests every Blood Brothers steering joint at 4000-inch pounds of torque. This pre-shipment precaution insures dependable steering that cannot fail even under extreme torque pressure.**

Whatever the steering assembly, whatever problems it presents, Rockwell-Standard engineers can design and develop universal joints that are reliable, efficient and economical.



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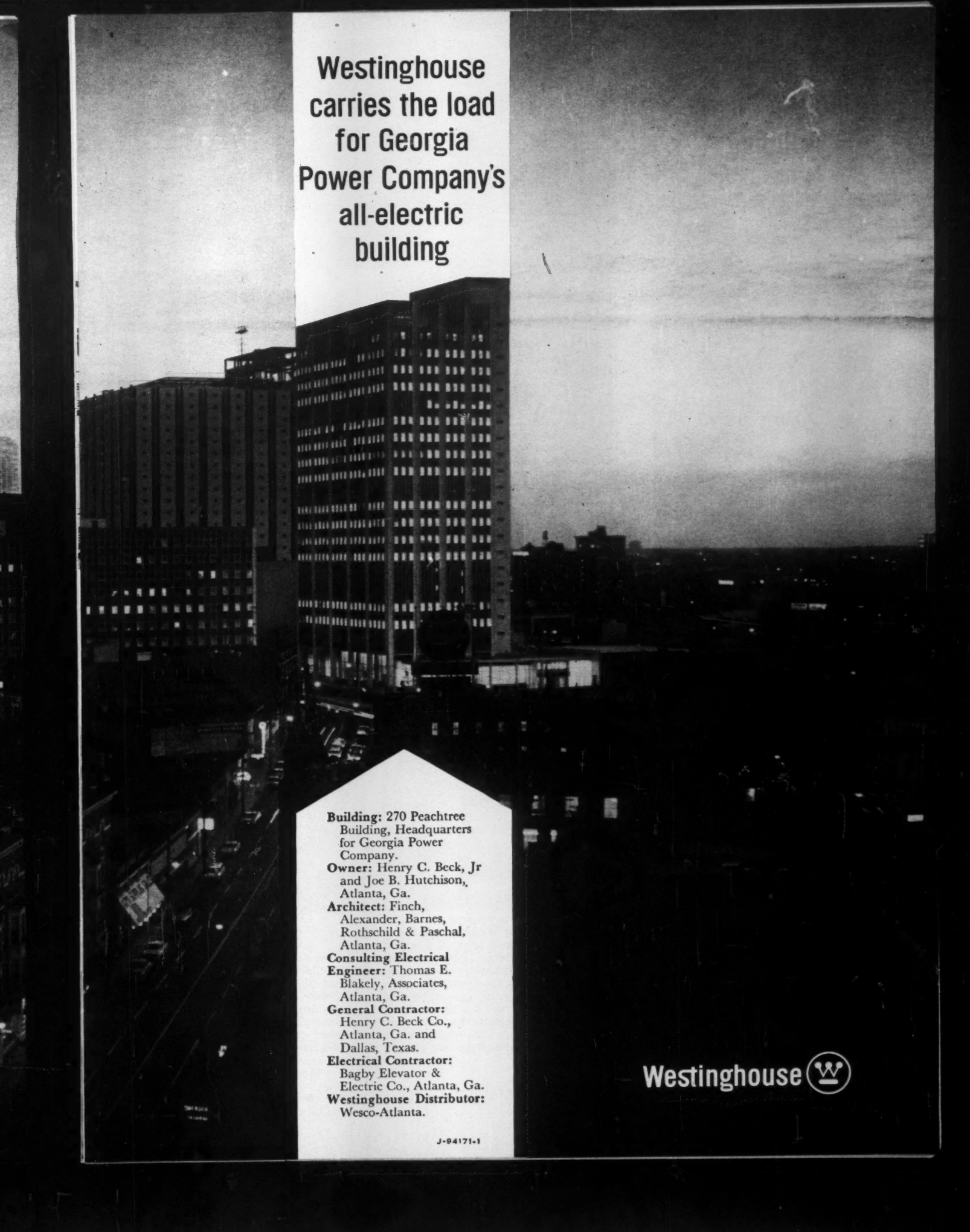


Westinghouse carries the load for Georgia Power Company's all-electric building

Building: 270 Peachtree Building, Headquarters for Georgia Power Company.
Owner: Henry C. Beck, Jr and Joe B. Hutchison, Atlanta, Ga.
Architect: Finch, Alexander, Barnes, Rothschild & Paschal, Atlanta, Ga.
Consulting Electrical Engineer: Thomas E. Blakely, Associates, Atlanta, Ga.
General Contractor: Henry C. Beck Co., Atlanta, Ga. and Dallas, Texas.
Electrical Contractor: Bagby Elevator & Electric Co., Atlanta, Ga.
Westinghouse Distributor: Wesco-Atlanta.

J-94171-1

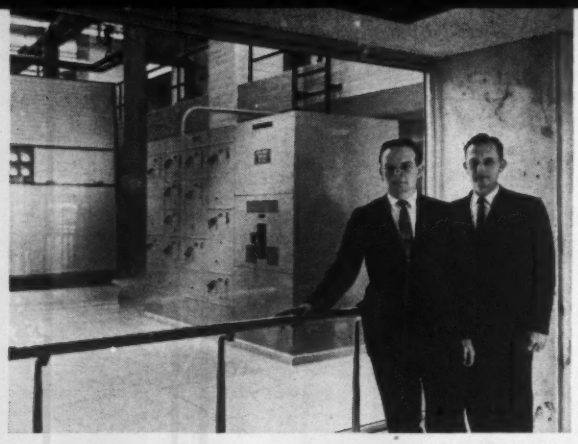
Westinghouse

Georgia Power Building

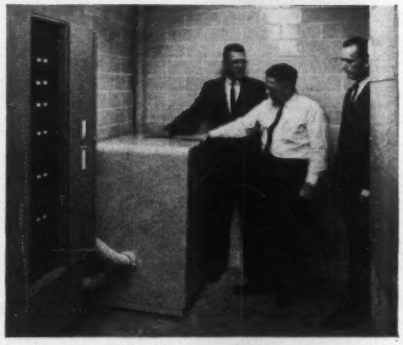
Atlanta

Designed with an all-electric concept, the 22-story **270 Peachtree Building**—Atlanta's newest skyscraper—serves as headquarters for the Georgia Power Company. Some of the electrical statistics:

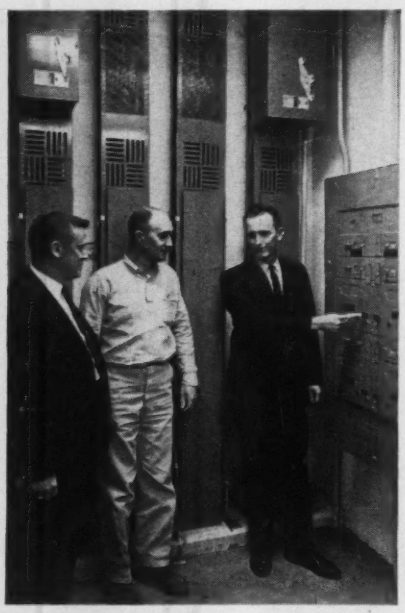
Service voltage—266/460
Service entrances—Two 4,000 ampere bus duct runs
Main breakers—Two 4,000 ampere, parallel
Connected load—8,000 kilowatts
Estimated demand—4,035 kilowatts
Air conditioning—1,000 tons (two 500-ton units)
Ninety kilowatts of lighting per floor
Eighty-seven kilowatts resistance heating per floor
Total electric load—23 watts per square foot in office areas



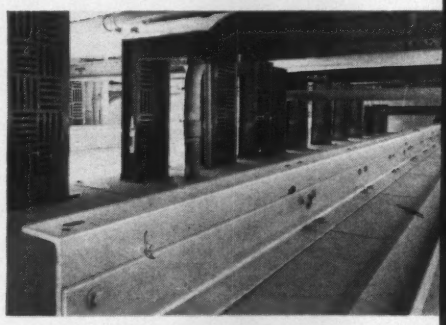
C. A. Alexander, Architect, and Earl Blakely, Consulting Engineer, shown in the handsome lobby of the Georgia Power Headquarters office building. Lobby was designed to showcase mechanical and electrical equipment and stress the importance of electrical services in modern office building operation. Westinghouse motor control center at right groups combination starting units into one structure affording flexibility, accessibility and safety. Modular construction features tilt-out design to isolate starters from bus for extreme safety in maintenance and inspection. This motor control center controls and protects mechanical room pump and fan motors.



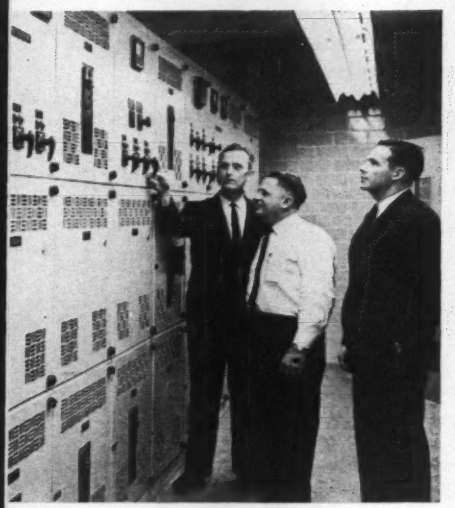
Discussing the low case temperature of a 300 KVA type DT-3 dry-type transformer are J. W. Tysinger, Westinghouse Sales Engineer; T. E. Luther, Building Superintendent and Earl Blakely. Silicone insulation in this class H (150°C) transformer offers greater resistance to heat . . . provides a greater range of safety for overloads . . . thus prolongs transformer life. This transformer steps 480 volts down to 120/208 wye for distribution. Westinghouse convertible type CDP panelboard at left contains De-ion® circuit breakers for positive protection against short circuits and over-loads.



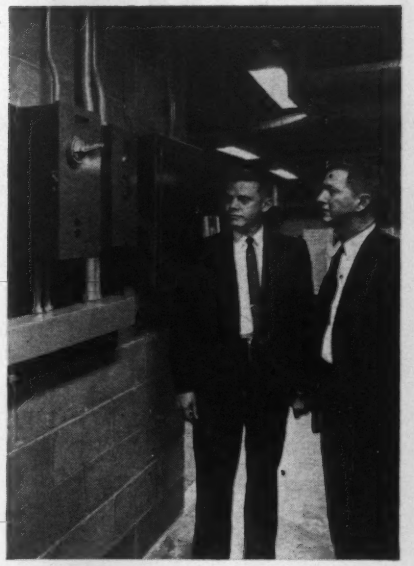
J. E. Chambers; O. U. Moore, Jr., Contractor Job Superintendent; and Earl Blakely, discussing a Westinghouse motor starter panel. Two such panels are located on each of the building's 22 floors to control supplementary perimeter heaters. New motor starter panels afford grouping when a small number of circuits are to be controlled. Low-impedance bus duct runs at rear feed electric heating. Bolt on power take-off devices limit high fault currents available in the system, protecting all electrical devices.



Top view of low-voltage switchgear shows two runs of 4,000-ampere low-impedance bus duct handling incoming power and nine 800- to 1600-ampere feeder runs. Six of these runs serve as vertical rise feeders that carry full power to all building loads. Bus duct was specified for its flexibility for future load growth additions . . . also, bus duct has a lower installed cost than cable or conduit. A high degree of coordination was necessary on this job to insure equipment match-up. Westinghouse provided this coordination in a complete line of quality equipment.

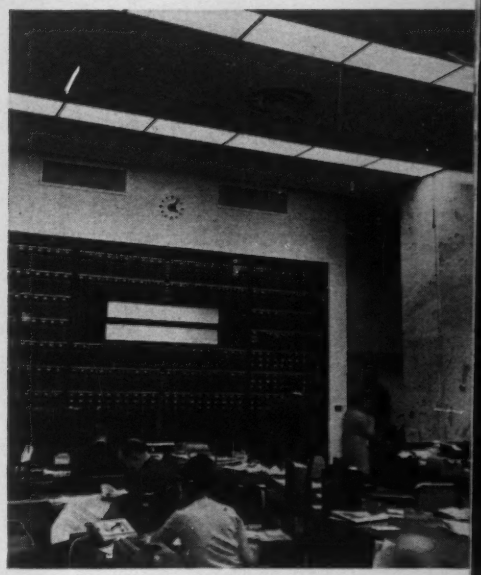


Earl Blakely, T. E. Luther and J. R. Miller, Westinghouse Construction Engineer, discuss metering on main assembly of metal-enclosed low-voltage draw-out switchgear. Incoming power is fed into two main DB 100 air circuit breakers. Electrically operated DB-50 breakers serve as feeders and another is used as a tie breaker so that entire board may remain energized during emergency. Current limiting fuses are mounted in series with all breakers to protect against high fault currents available. Westinghouse DB breakers were specified, since so much of the building load is fed from each breaker that dependable service from a heavy-duty breaker is an absolute requirement.



J. E. Chambers, Vice President, Bagby Elevator & Electric Co., and H. H. Cook, WESCO, inspect a Westinghouse Life-Line combination starter. A convenient start-stop button is mounted in the cover of this size 1 Class 11-206 combination starter designed for across-the-line voltage starting. A type AB-I 100 ampere circuit breaker is mounted at right. This breaker utilizes the De-ion principle of arc extinction which stretches and extinguishes an arc faster, with less contact temperature rise than any known system.

J. J. McDonough, President, Georgia Power Company and A. H. Wade, Jr., Manager, General Services Department, entering one of six high-speed Westinghouse Selectomatic® elevators located in the building. Comfortable cars are finished in white decorator Micarta® and are equipped with intercom and music. They serve this 22-floor building quickly and efficiently at 800 feet per minute.



Lobby floor office area of Merrill, Lynch, Pierce, Fenner and Smith, comfortably illuminated by 2′ x 4′ Westinghouse Mainliner fluorescent fixtures. Mainliners are available in a variety of sizes and mounting arrangements with a full line of shielding media for complete flexibility. In this installation Owens Corning Polarizing Panel shielding was utilized to eliminate glare on the automatic stock board.

Specify Westinghouse for completeness of product line . . . for complete service—before, during and after construction . . . for complete dependability. *You can be sure . . . if it's Westinghouse.*

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Fast, easy new TD-15 shifting saves effort, increases output. Size up the new "15's six-speed, full-reverse transmission with speeds spaced to use extra power and often work a *speed faster* than competitive rigs. See how the six speeds forward, six reverse, are arranged for easy short-travel, single-stick shifting. Change forward-reverse direction fast with the "Shuttle-Bar." Check the power-transfer efficiency and operating ease of the new "15's heat-defying, dry-type sintered metal engine clutch!

Give the new "15" a steady job of bulldozing solid materials! Advances like tapered, anti-friction bearings of greatly increased capacity — heavier shafts and deeper, stronger gear teeth — add thousands of hours to transmission component life. New transmission oil pump circulates and filters lubricant for longer gear life. Measure the added economy of features like the new sintered metal steering clutch discs which outlast previous type even while handling greater torque loads!

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Construction
Equipment

New "15" (151 SERIES)

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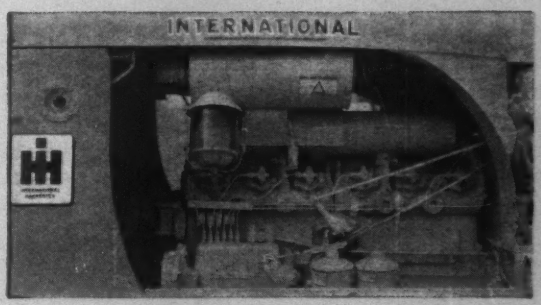
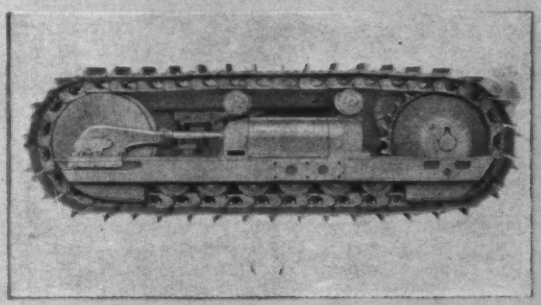
Start the new TD-15's 6-cylinder engine push-button easy — and get the seconds-fast warm-up which only International's famous gasoline-conversion starting provides. Note that *full load* for the new "15" is an overload for other rigs of the 100-hp class. See how the new pressure-type cooling teams with the larger capacity radiator — to give positive temperature control in hottest weather at full capacity 'round the clock.

Look at the "15's" new dry-type air cleaner. It's 99.8% efficient — and 100% convenient! Handy, underhood mounting and transparent, quick-dump collector greatly simplify servicing. International even provides a dash indicator that shows red when element needs servicing!



Prove new "15's" undercarriage strength!

To go along with precision-welded double-box-beam TD-15 track frames is the added strength of drum-type front idlers — the added protection of frame-welded track chain guides — the added service life of self-cleaning, power-saving strutless track links. The new "15" is the only crawler of its power class with the shock-load prevention of ball-joint suspension — basic in International's famous 3-point track mounting design! Improved, high-efficiency full-floating seals protect the long life Dura-Rollers — the track rollers you grease *only once* per hundred 10-hr. shifts!



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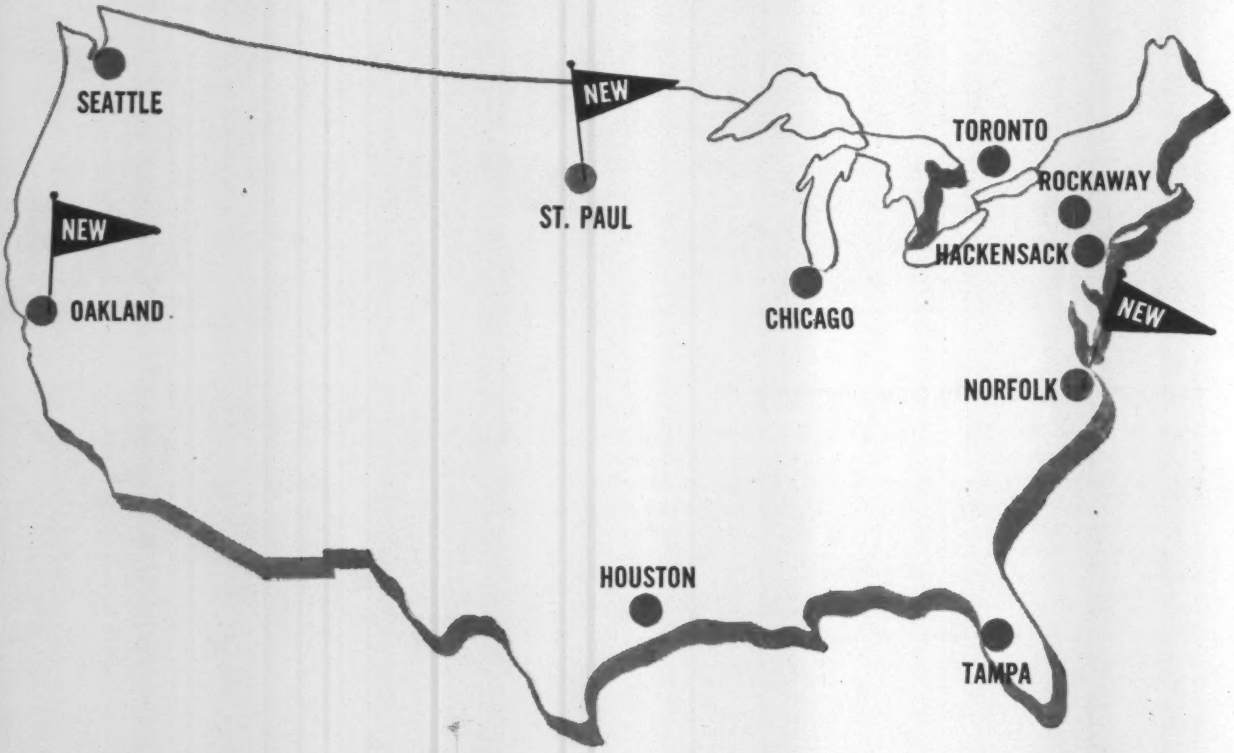

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ENGINEERING NEWS-RECORD

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Back issues of ENGINEERING NEWS-RECORD *are generally available for the previous six months. Semiannual indexes will be sent on request.* ENGINEERING NEWS-RECORD *is also indexed in the Applied Science & Technology Index, Business Periodicals Index and the Engineering Index.*

THE CONSTRUCTION WEEK

BAD REPORT CARD—"Incalculable waste of taxpayers' funds," said the New York State Investigation Commission in concluding public hearings of construction and maintenance work of the New York City Board of Education (ENR June 29, p. 17). A commission statement charged: "Improprieties in selection of architects"; "hasty, slipshod and careless" construction; "a sorry atmosphere of corruption"; and "buckpassing, but no effective action."

POWERFUL A-POWER PLANT—Pacific Gas & Electric Co. has applied for permission to build the largest A-power plant in the U.S., a $61-million, 325,000-kw project at Bodega Bay, Calif.

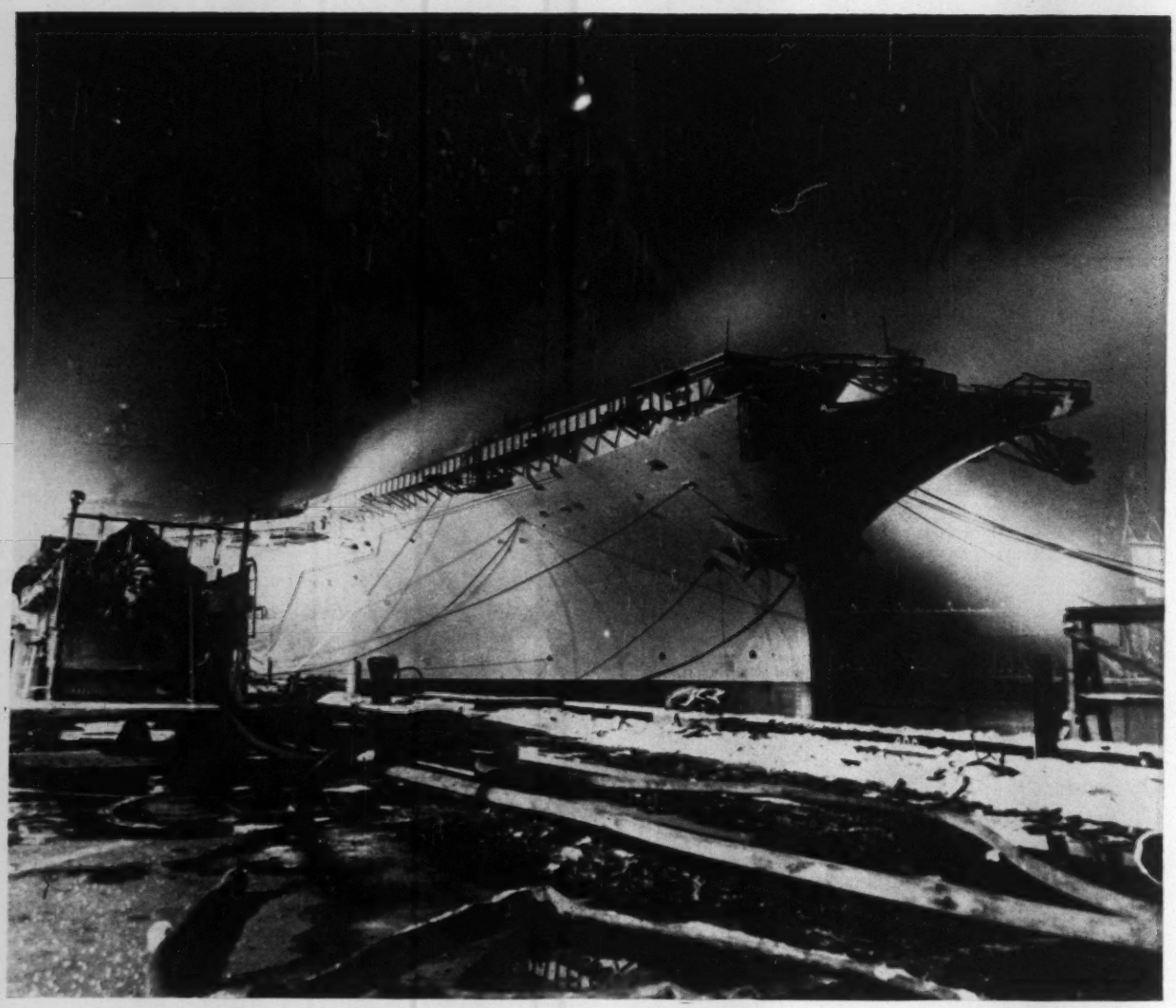
TEXAS TOWER REPORT—Reporting on investigations into the collapse of Texas Tower No. 4, the Senate Preparedness Investigating Subcommittee finds blame enough for all concerned—the Navy, the consultant and the contractors. Says the report: "Design criteria was clearly inadequate." Replies the consultant, Moran, Proctor Mueser & Rutledge: "We have no apologies for our part in the design of Texas Tower No. 4 which was . . . subjected to unprecedented wind and wave conditions."

PERMIT IN TIME SAVES FINE—Because contractors in Wilmington, Del., have been lax in obtaining building permits, they may be arrested. If a job does not display a permit the day it starts, and an inspector spots the lack, the offender will be arrested. The fine is $200, plus $50 for each day of violation.

BAD CLAMS UPSET FEDS—Water pollution in the Raritan Bay area of New York and New Jersey has drawn federal fire after a hepatitis outbreak was traced to sewage-contaminated clams dug there. Surgeon General Luther L. Terry last week called an August conference of New York and New Jersey pollution control officials to map cleanup action.

SIGNPOST OR A STOP SIGN?—The British Labor Party, in a document "Signposts for the Sixties," recommends that all land suitable for construction be bought by the government to "stop the uncontrolled rise in land values and exploitation of the public by private speculators." Building by private interests would then be subject to approval of a special commission.

EL EL MANANA?—The government of Mexico City has sent official commissions to Disneyland and Turin, Italy, in an attempt to resolve its mass transportation problems. The fast growing city (pop. 4 million) can't build a subway, because it stands on an old, spongy lake bed. The observers in Italy and Disneyland will study their elevated monorail lines.



Now Available: One More Safeguard Against the Spread of Fire!

Motivated in no small measure by the disastrous fire on board the U. S. S. Constellation, shipbuilders on the east coast recently looked into, then purchased, a new type of waterproof paper. A strong, paper-like material was needed for drop cloths and aprons around welding areas and, needless to say, it had to be *permanently* flame resistant.

Called Pyro-Kure, this U/L rated line of laminated papers prevents the passage of moisture-vapor. In addition, however, they also help in the reduction of fire hazards. Uniquely, when temperatures surrounding the material reach the combustion point, *it extinguishes itself*, and it retains this property *permanently*.

The major makers of insulation now use Pyro-Kure paper, foil and plastic film combinations as insulation facing, jackets for pipe insulation and over air-conditioning ductwork. Architects and engineers are increasingly specifying this product line for construction usage.

Pyro-Kure now makes it possible for these specifications to be fulfilled: *a vapor barrier with a permanent flame spread rating: kraft side — 25; foil side — 5.*

If you or your firm is interested in the concept of "total fireproofness" in construction you will want to know more about this development. Write to our main office for a complete file of data, facts, and samples. Department 207, Attleboro, Massachusetts.

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WASHINGTON OBSERVER

- **Sewerage, housing compromises reached**
- **School financing still up in the air**
- **Road funds passed; New Mexico's withheld**
- **Congress agreeable to desalting push**

● **House-Senate conferees have agreed on a stepped-up program of federal grants for construction of sewage treatment plants.** Final approval is certain. The present $50-million-a-year authorization will be increased to $80 million in fiscal 1962, $90 million in 1963 and $100 million in each of the subsequent four years. Maximum grant for a single project will be raised from $250,000 to $600,000.

The House prevailed over the tighter-fisted Senate on several major items in the multibillion-dollar housing bill (ENR June 29, p. 18). As finally approved, for example, the bill includes $500 million for community facilities in cities under 50,000 population. The Senate had approved only the $50 million asked by the Administration.

The House also won out on easier terms for FHA mortgages. Repayment terms are extended from 30 to 35 years, maximum mortgages are increased from $22,500 to $25,000, and down-payment provisions are eased slightly. Congress also approved a $75-million mass transportation program for research and demonstration projects as part of the housing bill.

—

● **Federal aid for public school construction and teachers' salaries isn't quite dead—yet.** The situation in the House is volatile.

There seems to be virtually no chance, however, for construction aid to parochial schools.

The big question is whether Catholic congressmen will support public school aid—recognizing that private school aid is unlikely.

President Kennedy may threaten to end aid to schools in "federally impacted" areas unless Congress passes his big school bill. Some three-fourths of the members of Congress get some help for schools in their districts under this program.

—

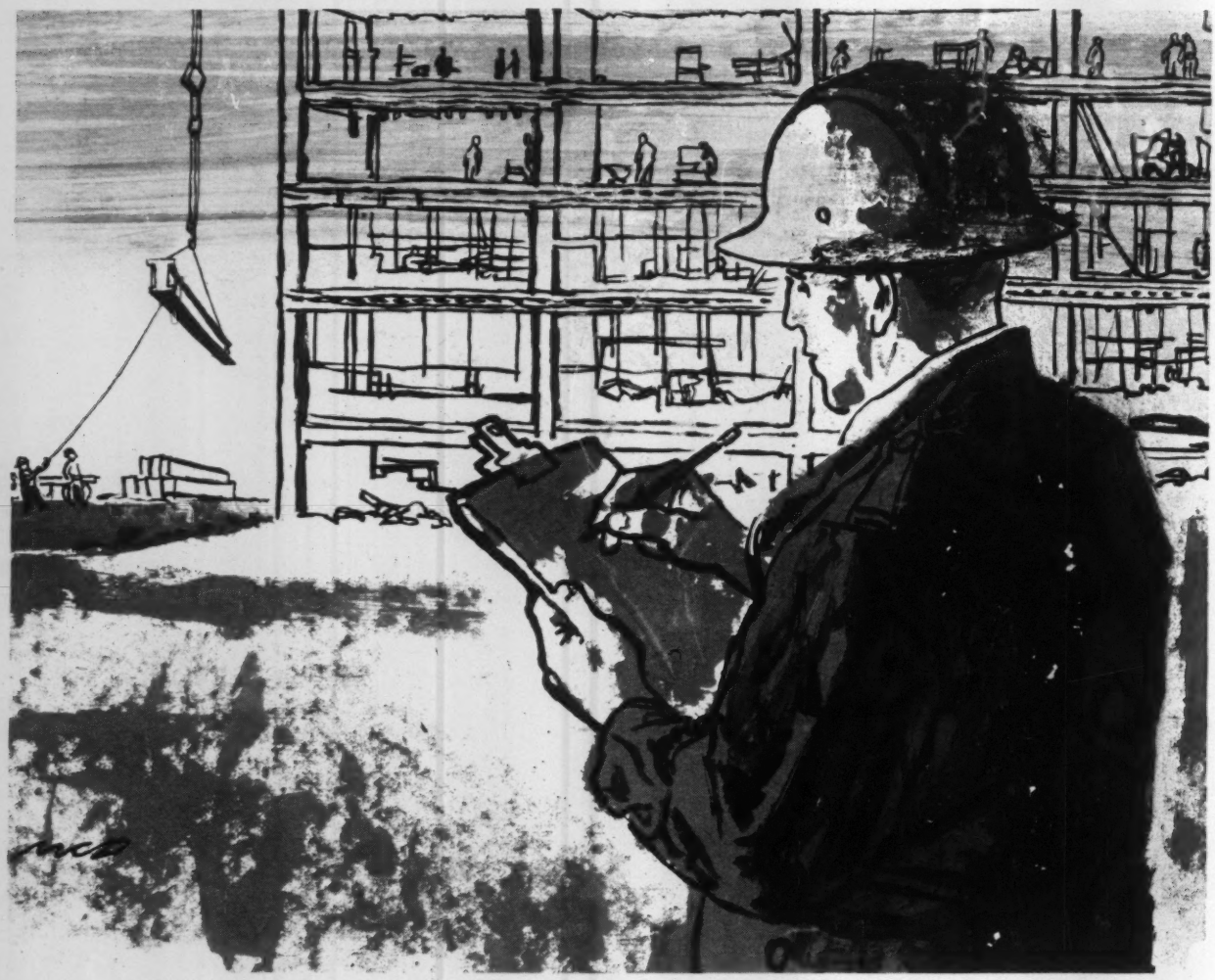
● **As the President signed new highway financing into law, the Bureau of Public Roads cut off federal aid for construction of new highways in New Mexico.** BPR's move was an outgrowth of Blatnik committee scandal exposes. Funds also are being withheld on projects under way or even completed that are involved in the scandals. The order will remain in effect until road construction is satisfactory.

—

● **Congress seems in the mood to give Mr. Kennedy the major expansion he seeks in the federal saline water conversion program—next year if not this.** The proposal would extend the life of the research and demonstration program from seven to 15 years and authorize construction of new and larger plants. Current conversion methods should produce fresh water at $1 to $1.25 per 1,000 gal. A cheaper method is needed.

PROTECTION IN DEPTH

How it helps cut compensation costs



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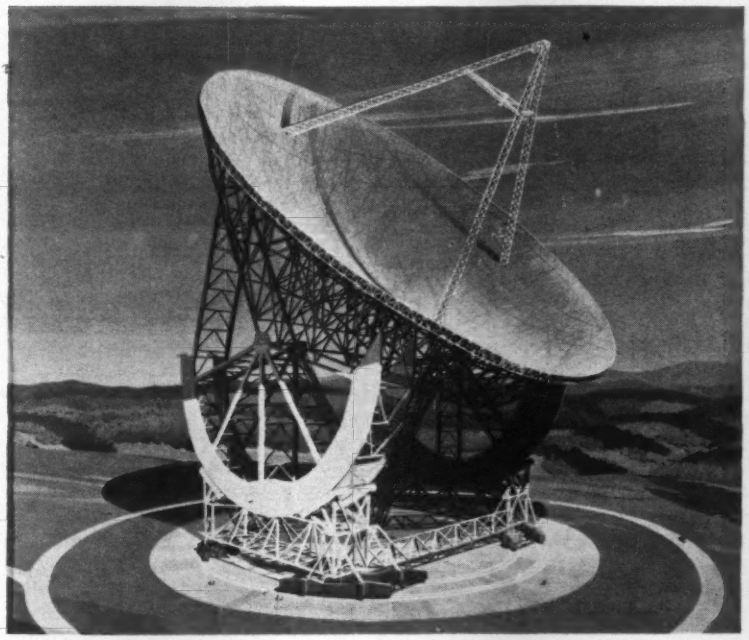
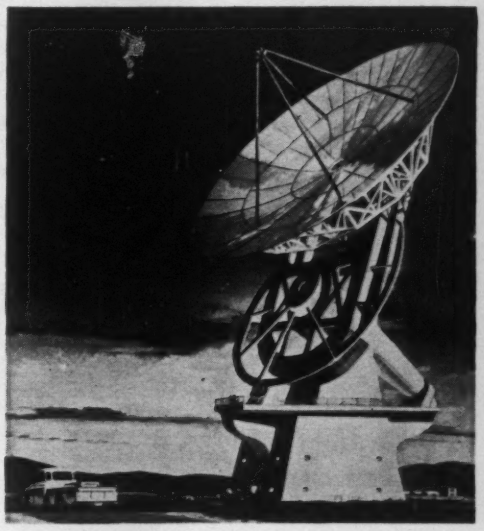
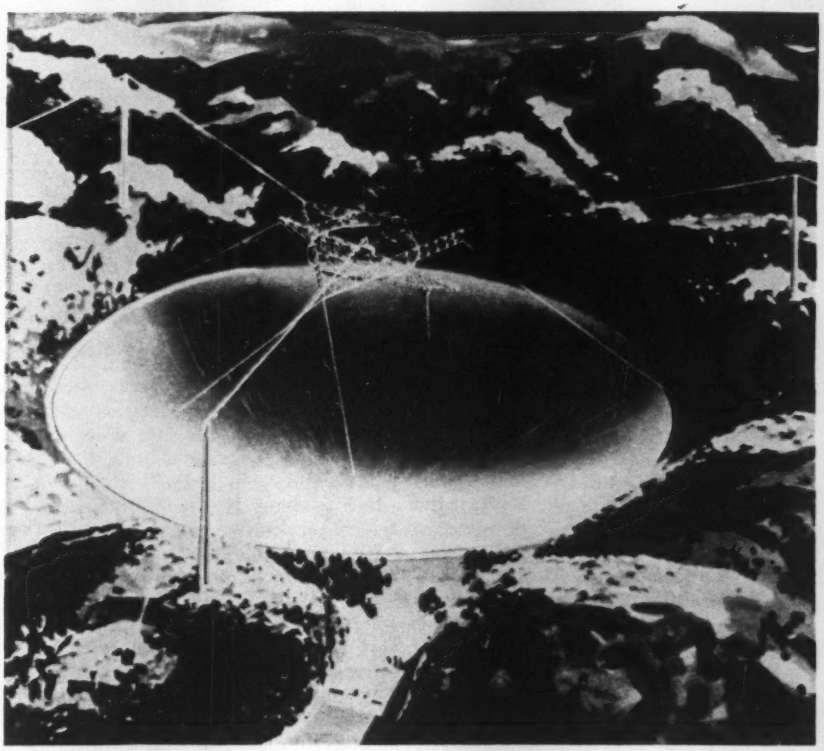


CANCELED? Navy may drop a $67-million effort to save $113 million.



COST DOUBLED Green Bank rises to $11 million.

Radio Telescopes Sight Trouble



DELAYED High costs, strikes and storms plague the Pentagon's Puerto Rico job.

Construction delays, spiraling costs and changes in needs may cause the Navy to cancel completion of its 600-ft radio telescope at Sugar Grove, W. Va. A decision as to whether to continue or cancel the project is before the Navy right now.

The basic consideration is whether the need for the facility has diminished sufficiently to warrant closing down the project. Although the Navy is tight lipped about the whole matter, reports are that the two- to three-year construction delay is forcing a reappraisal.

Officially, the Navy kept a security wrap on its precise plans for use of the radio telescope. The most the service said was that it had communication and navigational uses. Unofficially, however, reports were that the facility would be used partly for the Navy's program to bounce radio signals off the moon for long-range communication purposes.

This is done regularly now with other facilities. And, Navy progress in developing its transit satellite navigation system is moving ahead rapidly with the system due to be in use a year or so hence. Satellite communications are also under development that will temper the value of moon-bounce communications.

The latest cost estimate to complete the Sugar Grove structure has risen to

around $180 million from the original $79 million predicted in 1958 when the project was first started. On top of this the telescope will cost the Navy around $2 million a year to operate.

As of now, the Navy has spent some $27 million on the project. It estimates that it could close down the program for another $40 million.

The Navy is faced with the dilemma of whether it should pursue a trouble-ridden construction job that is decreasing in need, or junk the project and take the $67 million loss.

Whichever way the Navy turns, it is sure to be criticized. Top scientists in the nation, such as Herbert F. York, former director of the Advanced Research Projects Agency of the Pentagon, and James T. Killian, former scientific adviser to the President, opposed the Navy project from the start. Congressmen, too, are watching how the Navy turns on the issue.

One possible solution would be to turn the Sugar Grove project over to the National Science Foundation for scientific research purposes. But, a spokesman from that agency bluntly says he doubts if the agency would want to pump the additional $100 million or more into the project to complete it.

A Navy decision is expected within the next few weeks. The reason: More money must be committed to the project then. If the decision is made to go ahead with construction, the Navy says it still hopes to complete the job by late 1964. Final designs on the facility are due to be completed by Ammann and Whitney of New York by early next year.

Right now, no construction on the main structure is being done. American Bridge Division of U. S. Steel Corp., pulled out its crew this spring and likely won't go back to the site until next year unless activity picks up, a spokesman says. Work continues on the laboratory building and fabrication of aluminum liners for the 600-ft-dia dish is in progress at the site. New weight estimates have been established by the Navy at 35,000 to 40,000 tons, up from the 28,000-ton original estimate.

The Navy has plans to strengthen and add 16 to 18 additional wheels to the turntable trucks that will support the structure. If needed, the Navy says a relief post can be added from the elevation wheel bearing to a new set of turntable trucks.

The Navy isn't the only agency having trouble with radio telescopes. The National Science Foundation and the Pentagon face similar problems.

NSF is still trying to get construction of its 140-ft-dia radio telescope at Green Bank, W. Va., off of dead center.

Completion time for this facility has slipped two years to late 1963 and its cost has climbed from an original estimate of $5 million to $10 million or $11 million.

Recently, Associated Universities, Inc., acting as prime contractor on the job, hired Stone & Webster of Boston to supervise completion of the facility. Previously, this had been done by AUI's own staff.

Construction of a 1,000-ft-dia Department of Defense ionospheric research facility in Puerto Rico, under the direction of the Air Force, Cornell University and the Army Corps of Engineers, has run into trouble, too.

Started in 1959 and due to be completed this summer at a cost of $4.6 million, the project has now slipped a full year with its cost now estimated at $7.6 million. Design changes, strikes and bad weather are the reasons.

The telescope is being built in a natural volcanic crater in mountainous terrain in Puerto Rico. Rains made the site inaccessible from time to time, until paved roads could be built.

Last February, carpenters on the job went on strike for about a month to organize other workers. It cut the working force down to 20% of normal level.

The project calls for shaping the crater to a near spherical bowl. Then, bridge cabling will be criss-crossed over the bowl to support a 16- to 19-gage galvanized wire mesh liner. This will be suspended from 2 to 50 ft above the bottom of the crater.

Some 250 ft above the crater bottom, a concrete rim, 20 ft wide by 19 ft deep will be built around the edge of the crater to anchor the liner cabling.

Three concrete towers, two 265 ft tall and one 365 ft will provide support for several hundred tons of equipment that must be cable suspended some 465 ft above the center of the bowl.

Design changes were made in the cable suspension system, and the towers were each increased 15 ft in height. There is some concern that grading the bowl may have closed the natural drainage system of porous rock and natural caves. This may force the installation of a new drainage system for the project.

There is a chance, too, that new construction delays may come from forthcoming wage-labor negotiations.

Began career with ENR . . .

Noted Engineer-Publisher Dies

Willard T. Chevalier, who joined the staff of ENGINEERING NEWS-RECORD in 1922 and went on to become executive vice-president and director of McGraw-Hill Publishing Co., died last week at the age of 75.

Although less active in the publishing company in recent years (he retired from his executive post in 1957) Willard Chevalier had been at his desk the day he died.

He served the Army Engineers in France in World War I and was cited for "exceptionally meritorious and conspicuous services" with the 11th Engineers. He was generally known as Colonel Chevalier.

A civil engineering graduate and staunch alumnus of Brooklyn Polytechnic Institute, Colonel Chevalier served as a director of the American Society of Civil Engineers and as president of its Metropolitan Section. He was also president of the American Road Builders Association, the Highway Industries Association and the Water Works Manufacturers Association. Both of the last named organizations were predecessors of industry groups that exist today.

The American Water Works Association honored Colonel Chevalier with its John M. Goodell Prize in 1934; he was an honorary member and a past director of the association. He had also served as a director of the Society of American Military Engineers.

Willard Chevalier's career in publishing had him successively associate editor, business manager and publisher of ENGINEERING NEWS-RECORD. He went on to become publisher of other McGraw-Hill magazines, including BUSINESS WEEK. In 1944 he became executive assistant to the president, and in 1950, executive vice president of the McGraw-Hill Publishing Co.

Willard T. Chevalier

He served on the Anglo-American Council on Productivity from 1948 to 1952, an effort to increase the exchange of technical information between the two countries. He was also active in the International Chamber of Commerce, the National Association of Manufacturers and the National Industrial Conference Board.

Chicago Area Maps Flood Risks

A campaign aimed at keeping housing developments out of bottom lands in the Chicago metropolitan area was launched last week by four northeast Illinois counties and the U.S. Geological Survey.

They plan to spend $268,000 over the next five years in a flood-hazard-mapping and data-collection program described by Paul Opperman, executive director of the Northeastern Illinois Metropolitan Area Planning Commission, as the first major attempt by a metropolitan area to develop a scientific program for flood prevention.

The USGS will map the flood-prone areas and superimpose them in blue on 44 standard 7½-minute topographic quadrangles covering the metropolitan area. The agency will also collect additional stream data. Analytical and interpretive text, including a flood-frequency analysis and a listing of recorded floods, will accompany each map.

The maps would help counties and municipalities to:

- Prevent improper land development in floodway areas.
- Restrict uses hazardous to health and welfare that would lead to "undue claims upon the public treasury for remedy."
- Encourage adequate channel maintenance.
- Protect prospective land-owners from being victimized.

Tax-Change Action May Await '62

Congressional action on the Administration's tax-revision proposals may not be completed this year. The House may move, but too late for Senate action.

But one thing looks fairly sure: Congress apparently will reject President Kennedy's move to tax undistributed profits of U.S. business subsidiaries overseas. Instead, some means may be worked out to eliminate the abuses of so-called "tax havens" without killing the tax advantages of foreign operations.

Request for a new approach came to the Treasury Department from the House Ways and Means Committee, which found business united in its opposition to the Kennedy proposal. Representatives of construction companies argued that overseas tax advantages must be retained if U. S. companies are to compete successfully with foreign firms (ENR June 15, p. 21).

The Administration originally aimed not just at tax haven abuses, but at the tax deferral privilege on all earnings generated in developed countries. It proposed that income of subsidiaries in such countries be taxed at the U. S. rate when earned, rather than when repatriated to the parent as profits.

Construction industry representatives contended that taxing of earnings as generated would make U. S. contractors non-competitive in the foreign market.

But there is a gray area in existing tax laws that can give U. S. companies enormous unintended tax breaks. Profits of a subsidiary in one country can be transferred to a low-rate tax haven nation by maintaining a base in the latter. The corporation can then be liquidated and the profits returned to the U.S. to be taxed at the 25% capital gains rate instead of the 52% corporate income rate. Or, dividends can be returned to the company disguised as loans.

Bonn Backs Euphrates Power Job

The United Arab Republic got a $125-million credit from the West German Government toward construction of a multi-purpose water development project on the Euphrates River in Syria.

Cost of the irrigation and power project is estimated at $400 million.

The project will involve construction of two dams, a power station, main irrigation canal and an irrigation network.

First phase will consist of a downstream diversion dam about 1¾ miles long, a main canal, and a network of irrigation canals.

Second phase will include a storage dam impounding 20 million acre-ft, and a power plant.

It will take 10 years to complete the project. It will irrigate 1.7 million acres of now arid territory in Syria's Jezira Province and impound water for a 500,000 to 600,000 kw power plant.

The design study, which German firms will make, will take about 18 months. Construction may start in 1963.

Russian engineers made a study of the project in 1959 and 1960. As late as last December, it was believed the Russians would handle construction.

Although the Russian study consists of 14 volumes of geological, topographical, soil and hydraulic data, German authorities say it overlooked problems posed by the international route of the Euphrates. The river runs through Turkey and Iraq.

Tied-Back Embankment Slides Into Excavation

Collapse of previously undetected pockets of pulverized material caused a cave-in last week at the site of Seattle's new City Hall. "Slickenside pockets" were blamed. The collapse sent tons of stiff, fissured clay into an area to be occupied by a four-level municipal parking garage.

There will be no delay in construction of an adjacent 12-story municipal office building in the same block. No one was hurt.

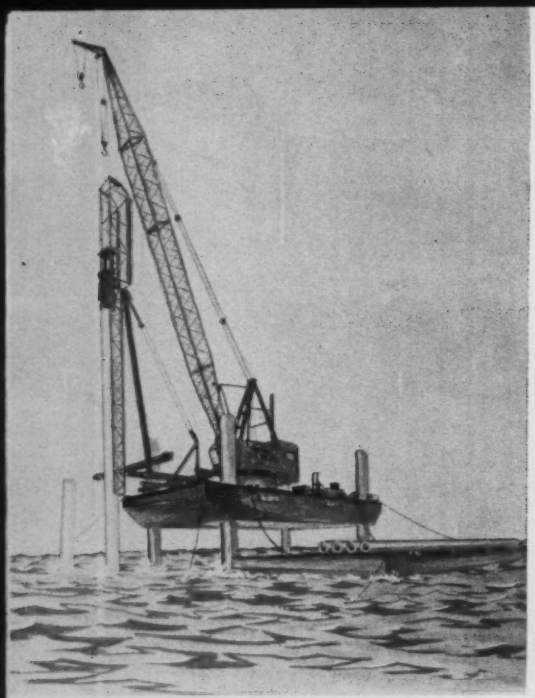
The bank that slid was 35 ft high and sloped back at a 1-to-5 batter. It was restrained by a tie-back system that had been used previously in East Pakistan during excavation operations for the Karanafuli River Dam, but not used before in this country.

Proposed by the soils engineering firm of Shannon & Wilson, the system involves the installation of expanding anchors in 8-in.-dia holes drilled 12 to 20 ft into the embankment. Pounding of the outer ends of anchor rods causes the inner ends to expand at the end of the holes, after which concrete is placed around the rods.

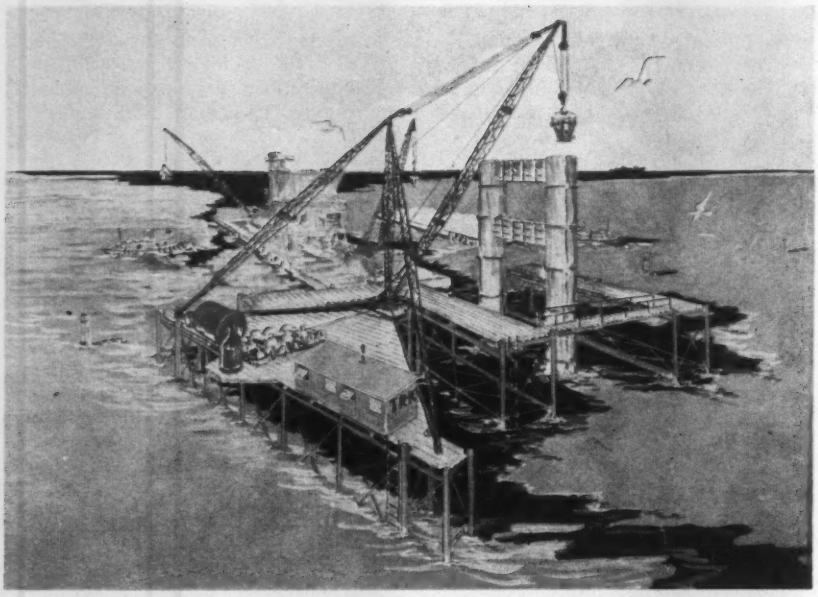
The anchors had been load-tested to 10 tons each. The bank was covered with wire mesh and gunited, after which 4x12 timbers were installed for bracing in 10x15-ft grids.

The slide started 15 ft back from the face of the bank, pushing the strongback system into the excavation extending along a 150-ft front, to a depth of 30 ft.

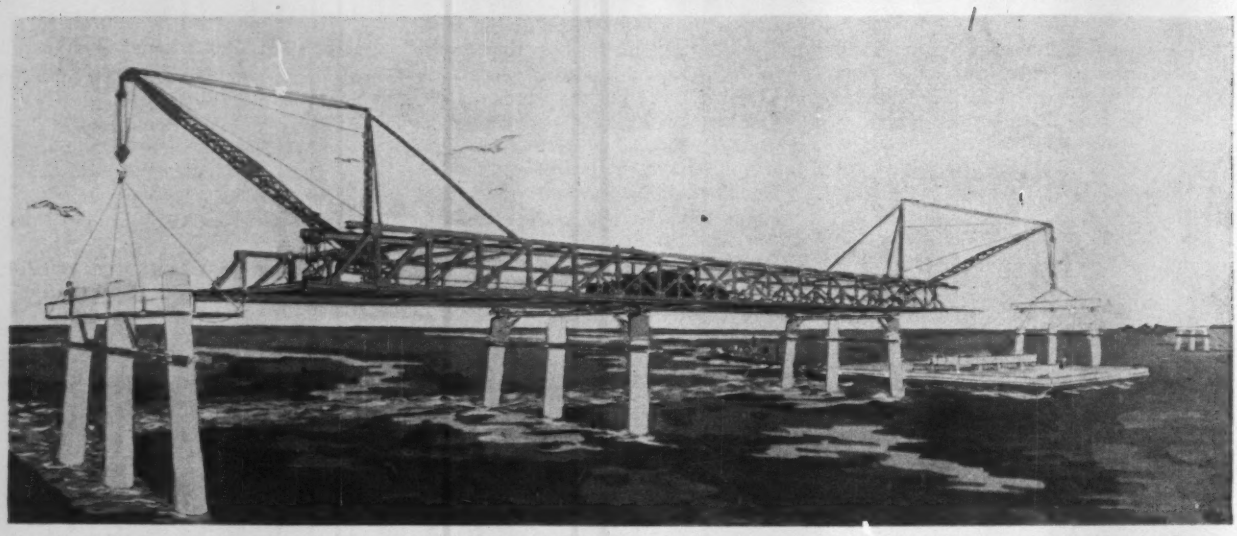
Patti-MacDonald-Milbur, Inc. holds the general contract for the $6.25-million project.



Four-legged pile driver and . . .



huge platforms will work on $120-million crossing, as will . . .



two-headed monster to handle pile cut-off frame at one end and pier caps at the other.

Giant Rigs Stalk Chesapeake Bay

Builders of the $120-million Chesapeake Bay and Tunnel project (ENR Aug. 11, 1960, p. 27) are moving to the attack with an impressive array of giant machines specially designed and built for deep-water work.

Among them are a DeLong pile driving platform that floats into place and then jacks itself out of the water; three sets of construction platforms for erecting the high-level bridges; a "two-headed" monster that carries a pile cut-off frame at one end and a cap setting and jacking rig at the other; another traveler to handle deck girder units; a floating concrete plant, and a 32x132-ft cement barge.

The special equipment will be used by the joint venture prime contractors —Tidewater Construction Company (sponsor); Merritt-Chapman & Scott Corp; Raymond International, Inc.; and Peter Kiewit Sons' Co. M-C & S will build the four islands and lay the tunnels. The other three will build the low-level trestles, earthfill causeway, substructures and roadway slab for the two high-level bridges and other phases of the work. American Bridge Division, U. S. Steel Corporation will erect the high-level bridge superstructures.

The contractors are developing the pile driving platform in conjunction with the DeLong Corp. The 70-ft-wide, 150-ft-long and 13-ft-deep floating rig will support a 100-ton revolving crane. It will be supported by four spuds 6 ft in diameter and 100 ft long. Each spud has a 30-ft-dia shoe at the bottom to prevent it from sinking into soft spots on the bottom of the bay. Workmen can remove the shoes if desired where the bottom is hard. Each spud is supported by a 500-ton capacity air jack supplied from compressors mounted on

the float. The stern will carry a set of universal driving leads.

Each of the three sets of construction platforms for erection of the bridge spans will carry a 75-ton, stiff-leg derrick. The platforms are interchangeable; each will carry boiler, derrick, three-drum hoisting engine, pile leads, change room and office.

The "two-headed monster" is a traveling bridge that mounts a stiff-leg derrick at each end. One derrick will handle a cut-off frame for cutting the cylindrical piles to grade. The other will handle a cap setting and jacking frame that has a four-way movement. The two outside piles in each of two bents will support the traveler while work is done on the bents before and behind.

Another 75-ton stiff-leg on a traveler will be supported by steel box girders resting on falsework between pier bents. It will handle the double-tee prestressed girders that go into each span. The traveler will place the deck girders (four to a span) behind and move the box girders ahead. Barges will bring the prestressed units to the traveler.

The contractors started pile driving in April, using a floating driver with a mounted tripod moonbeam rig. Barge of this rig is 60 ft wide and 130 ft long.

T-R-K has also built a large casting yard at Cape Charles, Va. for the Bayshore Concrete Products Corp. The plant will fabricate the 54-in. cylindrical piles, pile caps and deck girder units for the low-level trestles.

Path Cleared for Feather River Plan

It looks like full speed ahead for California's ambitious Feather River plan to collect and channel surplus northern water into the dry, but populous south and central parts of the state. The multibillion-dollar program has just weathered intact the 1961 session of the legislature.

Sweeping aside all proposals to restrict the undertaking, which includes a 730-ft-high earth dam and a 500-mile aqueduct, the lawmakers kept it firmly on the high road with two enactments before adjourning:

- A $48-million appropriation for the 1961-62 fiscal year.
- Authorization to create one of the water-using agencies vital to success of the program.

As a result, the program, to be financed largely by a $1.75-billion bond issue approved by California voters last November, will have a schedule something like this:

1961—Continue detailed designs on all phases of the system. Continue preliminary construction work at Oroville Dam. Open bids early in August for a 3,900-ft-long, 35-ft-dia diversion tunnel at Oroville. Call bids for other preliminary construction later in the year.

1962—Call bids for a major Oroville Dam construction contract. Perhaps, start construction on the San Joaquin Valley-Southern California Aqueduct System.

1963—Call bids on first sale of bonds from the $1.75-billion authorization. Bond sales will be spread over at least 10 years and perhaps as much as 20 years.

1964—Start tunnel through the Tehachapi Mountains. California Gov. Edmund G. Brown made this optimistic promise in a late June talk in Los Angeles. It may be difficult to keep, because of the complexity of the detailed design work yet to be done. If the tunnels are started, it should assure a new source of water to southern California by the 1971 target date.

The $48-million appropriation for the water program is part of the $2.6-billion budget signed by Governor Brown June 24. The money for water specifically comes from "The California Water Fund" which is an accumulation of revenues from tideland oil leases. These funds were set aside by the legislature at an earlier session for the water program, but each appropriation must be specifically authorized. In the $48-million appropriation, the legislature included $35 million for construction and site acquisition, about half of which is for Oroville Dam. The remaining $13 million is for planning, designs and administration.

Creation of the water group, the Kern County Water Agency, is important because the area encompassed by it, in the southern part of the San Joaquin Valley, will be one of the largest water users for the new state system.

Earlier legislation requires that repayment contracts be signed with water-user agencies covering at least 75% of the water to be delivered before any bonds can be sold.

The legislature resisted pressure to tamper with the state's contract with the Metropolitan Water District of Southern California, the huge utility that wholesales water to a five-county area including Los Angeles, and did not establish acreage limitations or power sale preferences as proposed by the AFL-CIO California Labor Federation.

The MWD contract was hammered out by state and MWD officials after months of negotiations just before the election last November. Observers said the resulting MWD support for the bond issue provided the slim margin by which it won.

The contract contained the stipulation that it become effective 90 days after adjournment of the 1961 legislature. This gave the legislators a crack at the provisions of the contract, since previous legislation had not stipulated the form of contract to be negotiated. The northern California-dominated state Senate attempted to enact restrictive legislation but the southern California-dominated state Assembly thwarted it. Since no action was taken, the contract stands.

The AFL-CIO California Labor Federation wanted water acreage limitations similar to those in the federal Reclamation Act. Their purpose was to prevent claimed "unjust enrichment" of large land-owners in the San Joaquin Valley, most of which are big corporations. Such a limitation could have worked in areas where water is delivered for the first time. But water leaders in southern California point out that it would have been an almost impossible requirement for MWD, which has water customers of long standing and of many sizes.

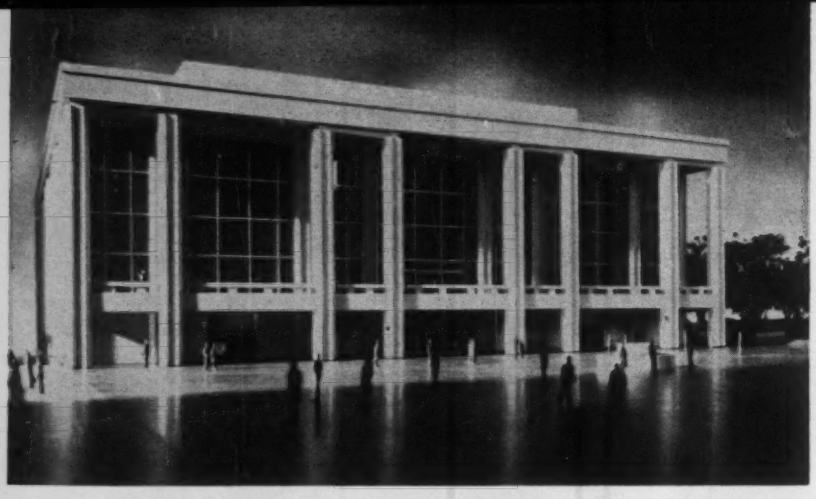
The labor group will continue its fight in the federal Congress by attempting to kill appropriations for the joint state-federal San Luis Reservoir. Their contention is that, since all water moving to the San Joaquin Valley and to southern California must pass through this reservoir, the federal reclamation law acreage limitation should apply.

The labor organization said it believes Secretary of the Interior Stewart Udall will not agree to any joint-federal use of San Luis unless the acreage limitation is provided. And federal legislation authorizing San Luis requires that a joint-use contract be signed by Jan. 1, 1962.

This legislation permits the reservoir capacity to be either 1 million acre-ft for a federal project or 2.1 million acre-ft for a joint federal-state project.

State administrators opposed preferential prices on power for public agencies on the grounds that the highest possible power revenues are needed to keep water sale prices at practical levels.

If the legislature expected to change the water program, this was the year to do it. The water issue may not come before the legislature again until the regular session in 1963. By that time, the project may be too far advanced to make any changes. One of the provisions of the water plan approved by California voters is that once bonds are sold, project revenues are pledged to their redemption. That, in effect, would prohibit the possibility of legislative change once the first bonds are sold.



Lincoln Center's Third Building

Lincoln Center for the Performing Arts in New York City has announced final plans for the third of its five main structures. It is the New York State Theater, designed primarily for operetta and dance performances.

Construction is well advanced on Philharmonic Hall, the first building in the Center. Final plans for the Metropolitan Opera House, the Center's dominant building, were announced in 1960. The other two units, a repertory theater and new quarters for the Juilliard School of Music, are still in the planning stage.

Construction of the New York State Theater should start in September.

It will be a reinforced concrete structure, about nine stories high. It will match the height of Philharmonic Hall standing opposite it. The two buildings form the sides of the Center's main plaza with the Opera House between them at the rear of the site.

Inside the theater will be a wide horseshoe-shaped auditorium with five tiers of shallow balconies above the orchestra level. Every seat in the house will be within 140 ft of the stage.

There will be no aisles on the main floor. Seat rows will be 40 in. apart—room enough for free circulation across the floor.

Between the entrance portico and auditorium at the first balcony level will be a 60 x 195-ft grand foyer for receptions and exhibitions. Three levels of upper balconies will hang from the roof to line the perimeter of the 45-ft-high hall.

Two elevators on either side of the building will run from the fourth balcony level down to the Center's concourse level below the plaza, providing direct access from underground roadways and subways to the various seating levels inside the theater.

Philip Johnson Associates is the architect for the theater. Severud-Elstad-Kruger Associates are the structural engineers. The joint-venture combine of Fuller-Turner-Walsh-Slattery is the general contractor. All are New York City firms.

Gold-Rush County Strikes Watts

The voters in Placer County, Calif. (pop. 55,000), put the county in the water and power business last month, approving by 25-to-1 a $140-million bond issue to finance construction of six dams, four powerhouses and 21.7 miles of tunnels.

The northeastern California county plans a construction start in about two years. Pacific Gas & Electric Co. will pay the Placer County Water Agency $6.4 million annually for the power for 45 years. Dependable output of the four plants will be 210,500 kw.

The project centers on the Middle Fork of the American River northeast of Auburn. The area is northwest of the $160-million Sacramento Municipal Utility District development of the Upper American River and upstream from existing Folsom Dam and the proposed Auburn Dam.

Major dams will be at Hell Hole, American Bar and French Meadows. All three are rockfills. The highest, at Hell Hole, will be 359 ft high. American Bar will be 288 ft high; French Meadows, 204 ft high.

Three smaller dams will combine with six tunnels—ranging up to six miles long—to divert and convey water to the power plants. Biggest of the four powerhouses will be a 116,000-kva installation at Middle Fork.

Voters in nearby Yuba County recently approved a similar bond issue for a big Yuba River project.

Engineers designing the Placer County project are McCreary-Koretsky, Sacramento and San Francisco.

ASTM Changes Name

Society revises several specifications and tests

As expected, the American Society for Testing Materials voted to change its name to American Society for Testing and Materials at its 64th Annual Meeting in Atlantic City last week.

The name change emphasizes the organization's interest in materials as well as in testing them. The importance of this phase of the society's activities was pointed up by the establishment last year of a Division of Material Sciences, to promote knowledge of the fundamental nature of materials. (For more about ASTM see p. 51.)

The subcommittee on structural steel approved for letter ballot a revision of Specification A 94 (formerly for silicon steel with 0.40% maximum carbon). The new A 94 will cover structural steel for riveted and bolted structures where saving in weight is important. Limited to material up to 4 in. thick, this steel will have a maximum carbon content of 0.33 to 0.37%, a minimum yield point of 50,000 psi.

The subcommittee voted to discontinue A 8 for nickel alloy steel, because of insufficient demand for this type of material. It also charged task groups with the study of a revision of A 242 to cover corrosion-resistant steels and development of a specification for quenched and tempered alloy steel plates, similar to U. S. Steel's T-1.

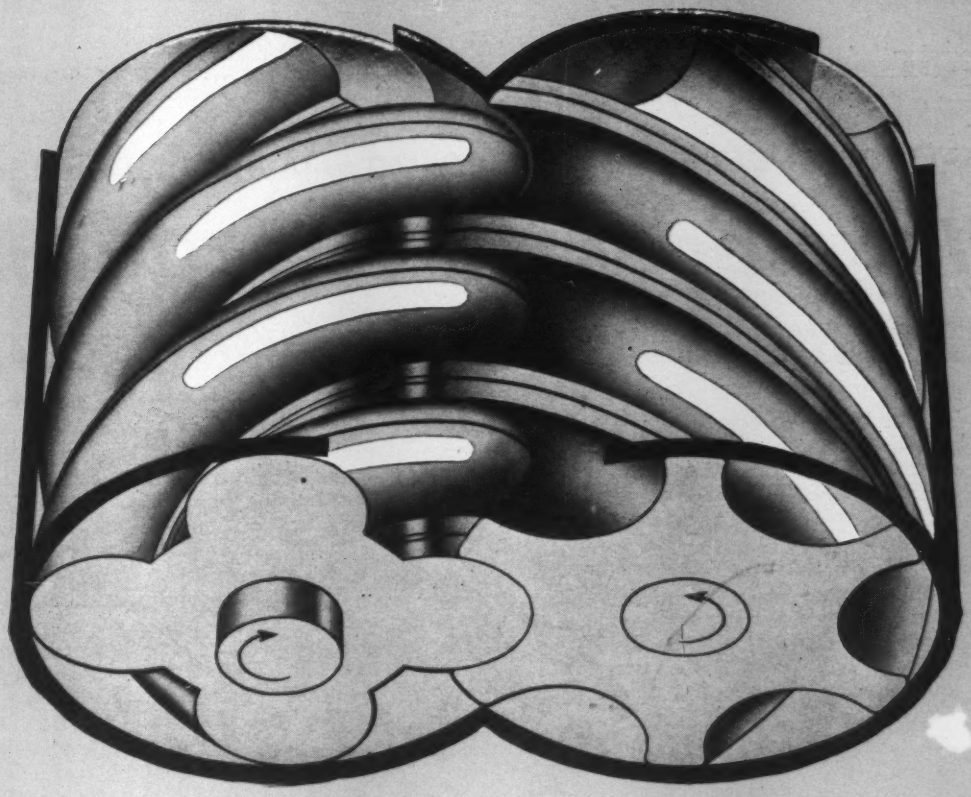
The subcommittee on reinforcing bars voted to continue its work on development of a uniform system of marking bars to indicate size, grade and point of origin. It passed an interim measure requiring distinguishing marks rolled on the bar surface, but the study will seek markings that will have numerals only to show bar size. The subcommittee tabled indefinitely a vote on a specification for reinforcing bars with 90,000-psi yield point.

The two-year-old Committee C-24 on Joint Sealants reported that it was developing definitions and test methods to apply to all types of sealants. It expects to have specifications for testing ready next year.

The one-year-old Committee E-17 on Skid Resistance adopted a standard tire for use in setting skid-resistance standards. It is trying to develop a set of criteria for measuring surface slipperiness.

Committee C-9 on Concrete voted revisions of C 94 for ready-mixed concrete. These affect quality of concrete and measuring of materials.

The society elected Miles N. Clair, president (p. 51), and Alfred C. Webber of du Pont, Wilmington, Del., vice president.



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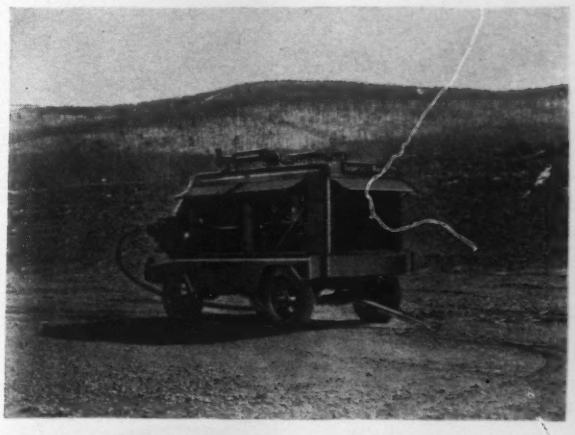
Ingersoll-Rand's sensational new 1200-cfm portable air compressor is no bigger than a 900-cfm machine, and weighs 1000 pounds less.

Its amazingly compact size and light weight are due largely to its advanced design single-stage cycloidal compressor with only two moving parts. As shown by the illustration above, the two cycloidal rotors form mating pockets of air that are joined and compressed as the lobes and grooves roll into each other.

Driven by a General Motors 12V71 diesel engine, it gives a new high in capacity per pound of compressor weight.

Ask your Ingersoll-Rand engineer or distributor for complete information.



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Pilot model passes 800-mile torture test with flying colors

The Link-Belt Speeder LS-78's tractor-track furnished ground-hugging traction no matter where the pilot model traveled — in the mud and muck of the Link-Belt Speeder proving grounds, the abrasive sands of the great Southwest, the punishing rock of the Big Bend region of the Rio Grande, and the hill country of southern Indiana.

During the one-year period the tracks were adjusted only *twice*. And this took the operator about five minutes per track belt, thanks to the exclusive hydro-piston adjustment with a grease gun. Compare this with a delay of up to three or four hours on some rigs that have only an adjusting bolt and nut arrangement.

Not once did the LS-78 walk out of its tracks! The reliable track compensating unit freed the track belt of branches, stones and other objects in its 800-mile journey. Snags and pesky obstructions proved no stopper either. The 22-inch high-clearance lower skimmed over them.

For further details on the exclusive LS-78 drag-clam-hoe with a *proven talent for travel*, see your local distributor. Or write Link-Belt Speeder Corporation, Cedar Rapids, Iowa.

109-61N

Normally high-wear track components

Track drive wheels

Track rails

1936 1961 | 25 years of controls leadership

After one year of testing (800 miles of travel), the LS-78 pilot model was returned to the factory for complete teardown and testing for wear. Four of the normally high-wear components were steam-cleaned and photographed beside new components in the series of pictures above. So negligible was the wear that if it were not for a fresh coat of paint on the new components, it would be difficult to distinguish between the two in each case.

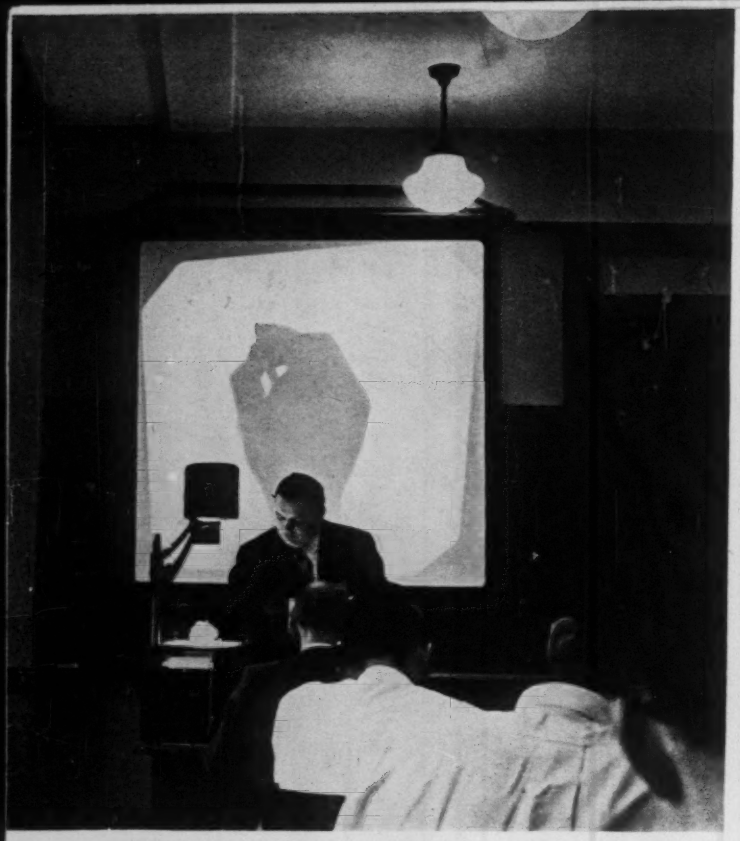
show little effect of travel abuse

Track idler wheels

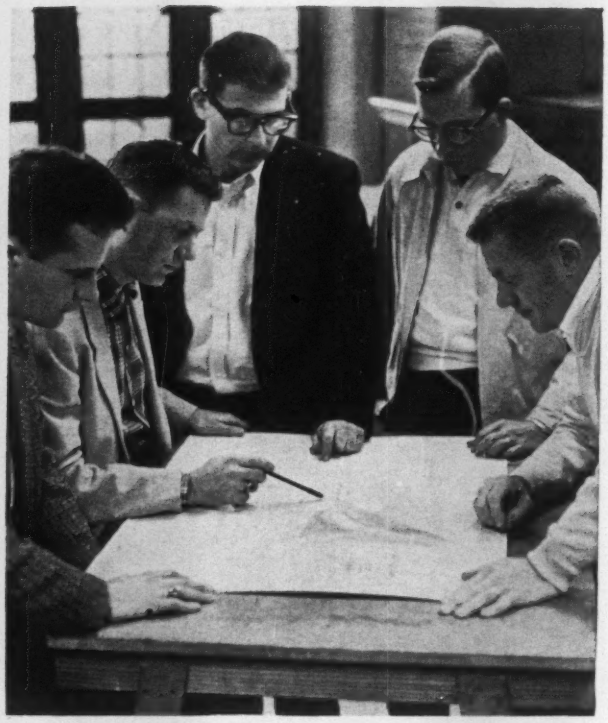
Track rollers

LINK-BELT SPEEDER

It's time to compare . . . with Link-Belt Speeder



THE BLACK HAND is a projection of Research Associate Matthew Huber's as he assigns a traffic measurement problem.



COMMITTEE APPROACH to assignments gives students experience in working with others and in project administration.

Yale Illuminates the Nation's Traffic

Harvard graduates may control the federal administration, but the nation's traffic is in the hands of Yale alumni in a way that isn't likely to change with a presidential election.

Alumni of Yale's Bureau of Highway Traffic, the only school in the country (and probably the world) devoted entirely to graduate-level training in traffic engineering, are either in charge of or second in command of traffic departments in 14 of the 20 largest cities in the U. S. and in half of all cities of 100,000 or more population. Graduates of the bureau also hold high-level traffic positions in a majority of state highway departments.

The Bureau of Highway Traffic has graduated 536 men in its 35 years (all but eight are still alive) and 90% of them are still in traffic engineering. The entire membership of the Institute of Traffic Engineers is only 1,400.

BHT graduates work in every state of the union except North and South Dakota, and in 23 foreign countries. More than half are in federal, state, county and city government and other public agencies concerned with street and highway traffic. Positions with nation-wide private organizations and with commercial agencies in transportation account for 34% of graduates.

Among the bureau's outstanding graduates: Edward H. Holmes, '30, assistant commissioner for research of the Bureau of Public Roads; Charles Prisk, '39, director of highway safety for BPR; William Froelich, '48, chief deputy secretary of Pennsylvania's Department of Highways; Robert O. Swain, '38, executive director of the International Road Federation; Alger F. Malo, '40, director of Detroit's Department of Streets and Traffic and president of the Institute of Traffic Engineers; Gordon K. Gravelle, '40, New York City's deputy commissioner of traffic and vice-president of ITE; Ross R. Shoaf, '40, San Francisco's city traffic engineer; Paul L. Ristroph, '38, director of New Orleans' Department of Utilities; and Roger H. Gilman, '37, director of port development of the Port of New York Authority.

Most of the 10% who strayed from traffic are in construction, but the alumni also include an attorney, salesmen, a personnel director for a chain of restaurants, an Episcopalian clergyman and a sausage company executive.

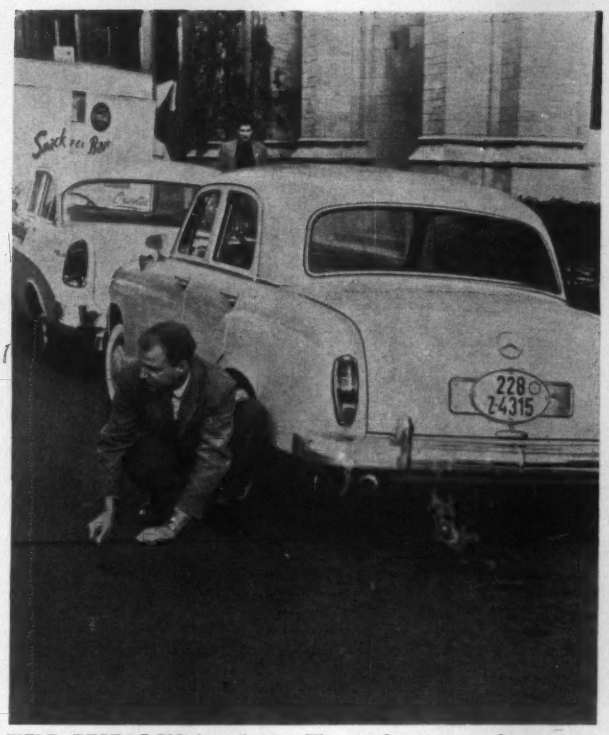
• **Started at Harvard**—The Bureau of Highway Traffic is a school usually described as being *at* Yale, seldom as *in* or of Yale. The bureau's original home was Harvard, where it was established in 1926. But Harvard wanted to make the bureau part of the school of engineering. Rather than lose its autonomy, the bureau moved to New Haven in 1936.

Yale provides classrooms, a laboratory and office space for the bureau in its Strathcona Hall and the bureau relies on the university for administrative support and a retirement plan for its faculty. The university's four-man Committee on Transportation, made up of a professor of transportation, the dean emeritus of school of engineering, a civil engineering professor and the bureau director, administers the bureau.

The BHT faculty has been so successful in maintaining its independence that the bureau is probably better known nationally than on the Yale campus. A foreign student complained recently that letters sent to him in care of the Bureau of Highway Traffic were returned with "address unknown" stamped on the envelopes.

But engineers know about it: Each year the Committee on Transportation rejects three or four applications for admission for every one it accepts. And traffic agencies know it, too. Job-offers outnumber job-seekers three to one.

The bureau offers a one-year course leading to a certificate in traffic engi-



FIELD RESEARCH for theses fills much of second semester. Students here set out pneumatic tube to record traffic volume.

FIELD TRIP to Port of New York Authority gives students look into approach system of the George Washington Bridge.

Lights

neering. Some students feel they should get a master's degree for the work they put in, but the course, restricted to traffic engineering, is too limited in scope to qualify. It's possible, though, for bureau students to apply their year in traffic to a two-year Yale course in city planning.

• **Goes beyond engineering**—The faculty members of the Bureau of Highway Traffic believe that traffic engineering is more than engineering, that it also involves sociology, administration and city planning. So BHT students study traffic characteristics and measurement; traffic regulations and control; advanced geometric highway design; socio-economic analyses in highway transportation; city planning; and planning administration.

"The program is organized on the principle that highways, streets and associated facilities exist to serve motor vehicles and the people in them," says research associate Matthew J. Huber. "We feel a roadway is built and operated to reflect vehicular and driver characteristics. This applies over-all, from a simple street intersection, where truck turning radii determine design, through complicated signal control systems where driver reactions and vehicle deceleration and acceleration characteristics determine the pattern.

"More important," says Mr. Huber, "we present this against the background of why people are in their cars and why they live at A and work at B and shop at another point. No traffic facility exists that doesn't have these desires as essential elements in determining route location and design.

"Increasingly we heed the warnings of urban planners and we recognize that transmission of 100,000 cars a day over the shortest route may *not* outweigh the need to maintain an existing neighborhood or recreation area.

"We try here to put traffic engineering in its place in the whole fabric of our way of life so that it reflects the social and economic impact of urban transportation."

• **Run by an alumnus**—The man responsible for developing these ideas and for putting them into practice is BHT Director Frederick W. Hurd, soft-spoken, highly articulate veteran of design and traffic work at state, county and city levels. He graduated from BHT in 1939 and returned as associate professor in 1945. Nine years later he was appointed director.

He joined the Missouri State Highway Commission in 1934, right after graduating as a civil engineer from the Missouri School of Mines. He started out in design work, went to BHT and returned to Missouri to work for three years as traffic engineer. Then he worked in Michigan from 1942 to 1945, first in the Wayne County Road Commission and then as traffic engineer for the State Highway Department.

Like the director, the other members of the faculty have had professional experience in traffic. This background plus a strong feeling for the human element in traffic has produced a bureau philosophy of traffic engineering: Operational efficiency comes first.

"Take the planning of an expressway or a highway, for instance. There is a common tendency to build narrow median strips to save money," explains Mr. Hurd. "Many people lack appreciation for the long-range value of wide medians. I like to think that our boys would get the wide median or else. All these things are compromises, but we hope our graduates would be the last to give in on compromise and would insist on common sense."

"On the other hand, our stand of 'efficient operations' has meant a struggle with over-enthusiastic safety people, the sort who want governors installed on all cars. We want a sensible, working system. One of the reasons our graduates rise in their organizations is that they are operationally minded."

• **Work on projects**—A steady flow of project-type assignments makes the stu-

(Please turn the page)

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WE LOOK AT HIGHWAYS from the motorists' point of view, says Bureau of Highway Traffic Director Frederick W. Hurd.

dents practice bureau principles of traffic. Instructors divide the class into committees of five or six men, each group responsible for working out the project. Committee chairman do none of the project work, but concern themselves with planning and assigning the work and seeing that it is completed. Committees are rearranged for each problem. This way the bureau students learn how to work in groups and get practice in administration.

The first semester is a steady 9-to-5 grind of lab and classroom work and committee projects. In the second semester, the traffic acolytes get outside more, concentrating on individual work, particularly the thesis that each of them must submit. They are free to pick their thesis subjects, but the BHT faculty encourages field research over library work.

Typical subjects this year: "Comparison of Speeds Under Adverse Weather Conditions on Asphalt and Concrete Pavements," "Driver Tension on Freeways," "The Effects of Transverse Striping at Toll Booth Plazas," and "The Effect of View Obstruction on Driver Behavior at Stop Sign Controlled Intersections."

In addition to this work, there's a weekly reading assignment, about 100 pages of articles that must be analyzed, not just scanned. Each week a man prominent in traffic or transportation appears before the class as a guest speaker. The students make two field trips each year, one to inspect the facilities of the Port of New York Authority (which employs 12 bureau grads) and the other to attend the annual meeting of the Highway Research Board in Washington, D. C.

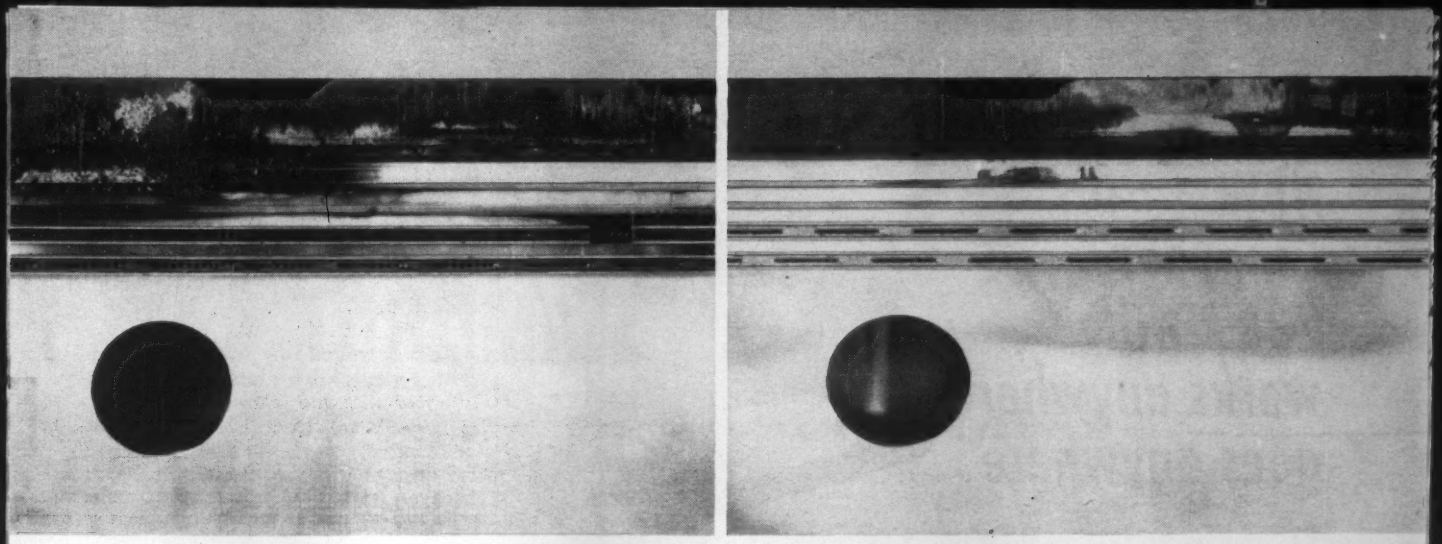
All students attend the same classes at the same time and carry equal study and assignment loads. One of the results of this system is a feeling of unity and identity similar to that existing in military academy classes.

"One of the reasons for having all of them take the same work simultaneously is that we can tell if we're pushing them too far or not far enough," says Mr. Hurd. "But they come here to work. Some of them say they haven't seen a movie since they've been here."

About 150 men applied for admission to the '61 class. The Committee on Transportation rejected one-third of the applicants initially because they didn't come up to the bureau's high standards of admission. The next big elimination came when the committee decided which of the applicants deserved fellowships or other aid. Almost 90% of applicants apply for fellowships.

From 17 to 20 students attend the bureau each year on fellowships and there are also tuition scholarships. The Automotive Safety Foundation provides 10 fellowships a year. Others come from the Esso Safety Foundation, the James S. Kemper Foundation, the Insurance Institute for Highway Safety and, for foreign students, the International Road Federation and the International Cooperation Administration.

The Automotive Safety Foundation



Left: Poor performance of competitive diesel lubricant is easily noted on piston rings.
Right: Superior cleanliness—typical of Shell Rimula Oil performance.

BULLETIN:

Shell reveals how Rimula Oil saved a road construction company $37 per diesel engine on each drain period

A leading road construction company tested Rimula® Oil on a freeway job.

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A LEADING road construction company was having two costly problems with its supercharged diesel engines. Deposits were impairing engine performance. Oil drains were required every 80 hours—far too often for economical operation.

To fight these problems, the company switched to Shell Rimula Oil. After 2000 hours of operation in these same diesel engines, the oil's performance was evaluated.

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1. Improved engine performance. Shell Rimula Oil greatly reduced lacquer and valve deposits.

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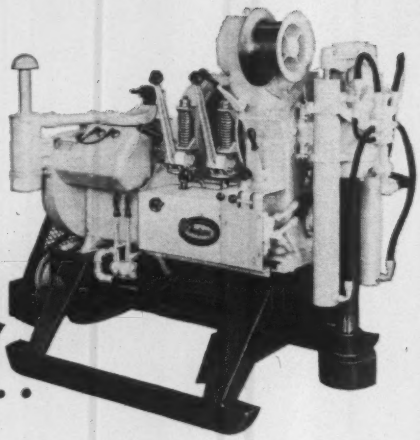

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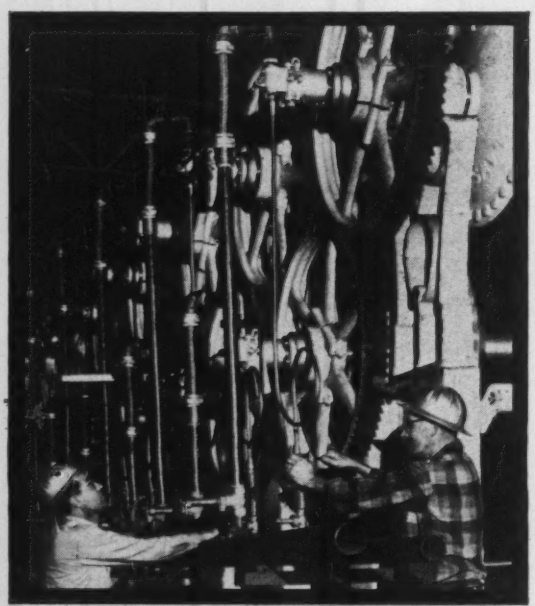

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not only pays for 10 fellowships, it finances most of the bureau's operations and underwrites faculty research on a project basis. This year's grant is $67,500.

Because of BHT reliance on annual grants, its faculty can't hold tenure of office and be called professors. Research associate is equivalent in rank to associate professor.

• **Not attended by youngsters**—Bureau students are a more mature group in appearance and manner than the average post-graduate men at Yale. Most of them have worked a few years, some for quite a few. Several of the heads bent over notebooks in lecture rooms show hair that is thin on top. Students' ages in the 33-man class of '61 range from 22 to 45. They come from 15 states and Hong Kong, Sweden, Canada and Australia. Two-thirds of them have families with them in New Haven and five children have been born to bureau students' wives so far this year.

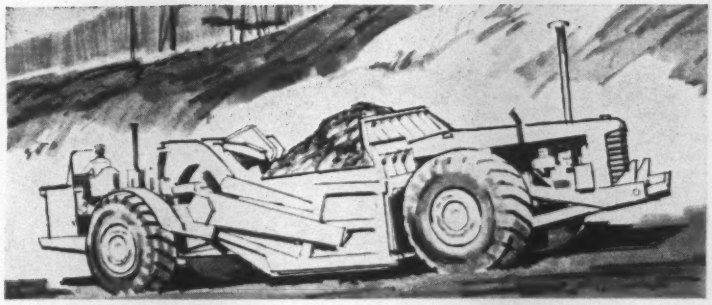
A heavy work load and the bureau's detachment from university affairs offer few opportunities for traffic engineering students to get involved with the rest of Yale and its student activities. Because Yale works on a system of colleges, in the manner of British universities, unmarried bureau students have to find private lodgings. Some students, particularly the foreign ones, eat dinner occasionally at the various colleges to get more variety of conversation.

All members of the class of '61 have engineering degrees, most of them in civil engineering. The bureau insists on this background. It enables the faculty to presume training in design, statistics and calculus and an ability to grasp quantitative aspects of problems rapidly. The bureau's rules on a degree from an accredited engineering school aren't inflexible. The Committee on Transportation has in the past accepted an economist and a physicist and they would consider a sociologist.

More than half the BHT students are on leave of absence from jobs with state highway departments or city traffic departments. Many of these are on half or full pay status as part of in-service training. In a few cases state legislatures have had to pass special laws to enable highway department employees to attend the Yale bureau, because it was an out-of-state institution.

The consensus of the students at Strathcona Hall is that it's a tough course, harder than anything they ran into in engineering schools. The human element that plays such an important part in traffic engineering makes the work more interesting, but the indefinite, unpredictable quality of human behavior frequently irritates minds trained in the certainties of engineering.

ALLISON
smooths out starts
TORQMATICALLY



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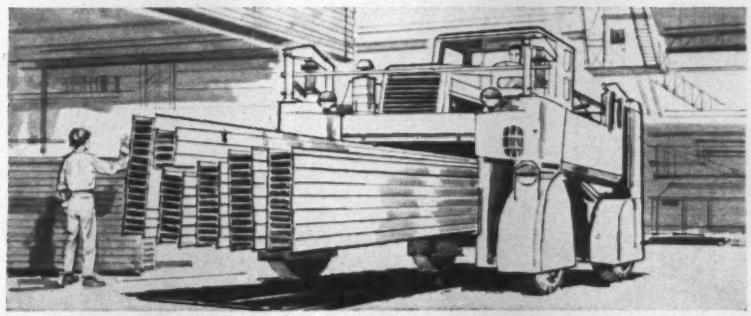

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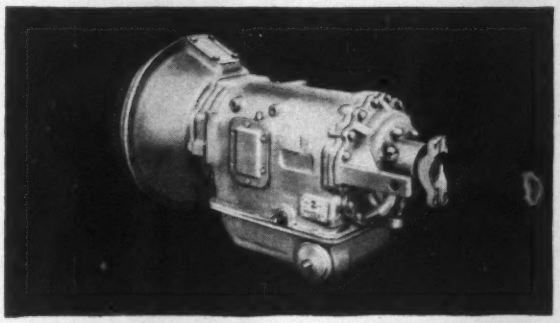

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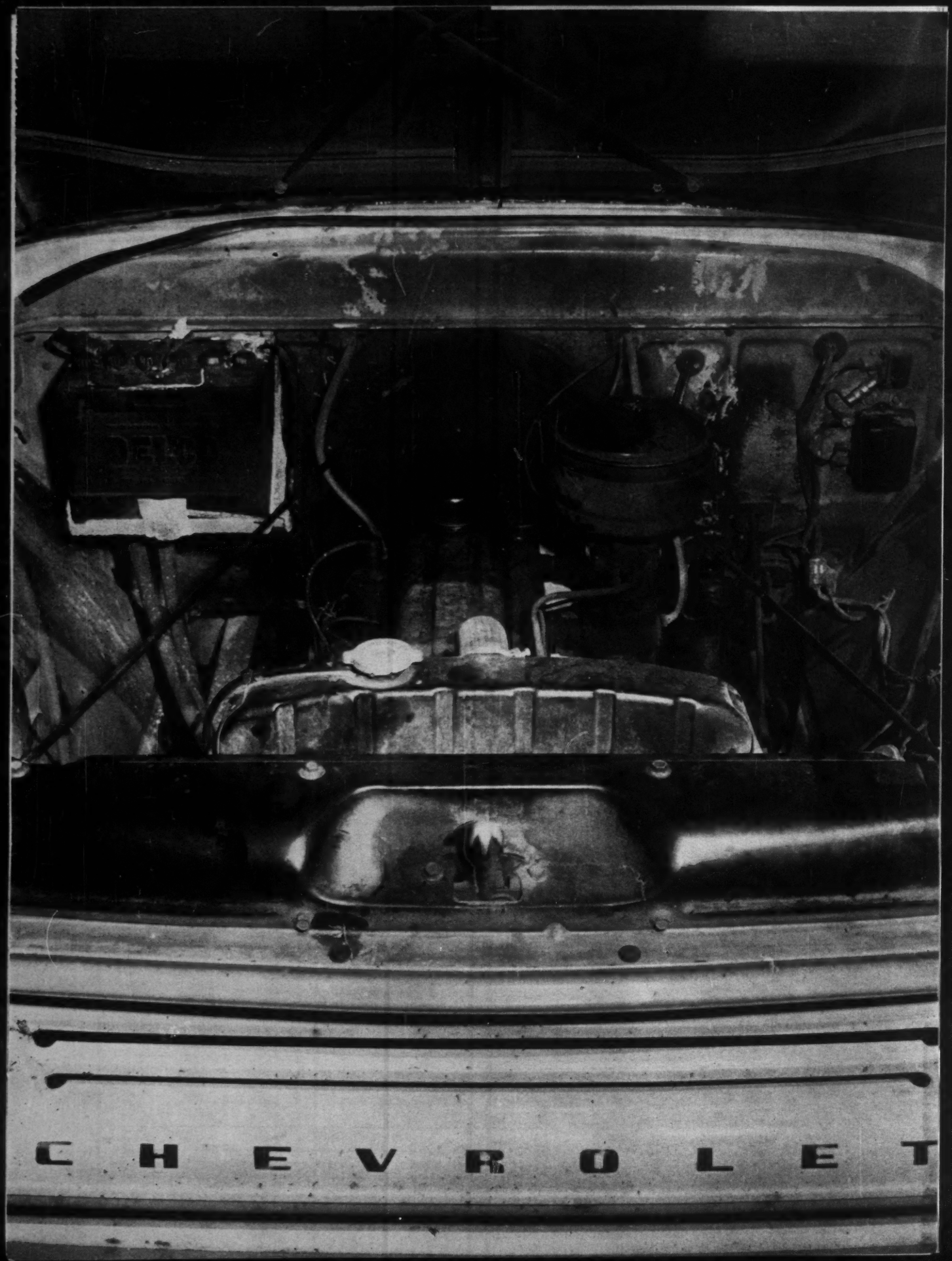

CHEVROLET

OLD PRO

That truck engine on the opposite page is one of Chevrolet's famous Thriftmaster 6's—and if it looks a bit battle-scarred, there's a good reason! This one has just turned 230,000 miles, working for Earl McDaniel of Dallas Texas, on a hustling round-the-clock air mail delivery job. *And here's the stopper: this engine has never been overhauled. It has required only routine maintenance over all those miles.* That, you'll agree, is professional *truck* power at its dollar-saving best. That's the way it is with the most widely used engine in the business—Chevy's Thriftmaster 6!

Rarely does any truck engine—even a Chevy Thriftmaster 6—run up a performance record like this one. We point it out here merely as proof that the Thriftmaster 6 brings *staying power to spare* to any job it tackles. It's evidence that Chevrolet puts real *truck* "horses" under the hood—in a light-duty power plant that's built to outlast and outsave any other you can name.

Hustling air mail from airports to town on a stop-watch schedule is a 24 hours a day, 7 days a week responsibility Earl McDaniel, U.S. Mail Contractor, shares with his '59 Chevy ½-ton panel. And, according to Mr. McDaniel, after 230,000 miles, the truck "still purrs like a kitten . . . hasn't had or needed an engine overhaul. The pan has never been off, the valves have never needed grinding."

The Thriftmaster 6 provides the basic power for Chevy's conventional light-duty truck line. *Standard* in pickups, panels, light-duty stakes, delivery vans and the Suburban Carryall, it's the end product of many years of engineering refinement.

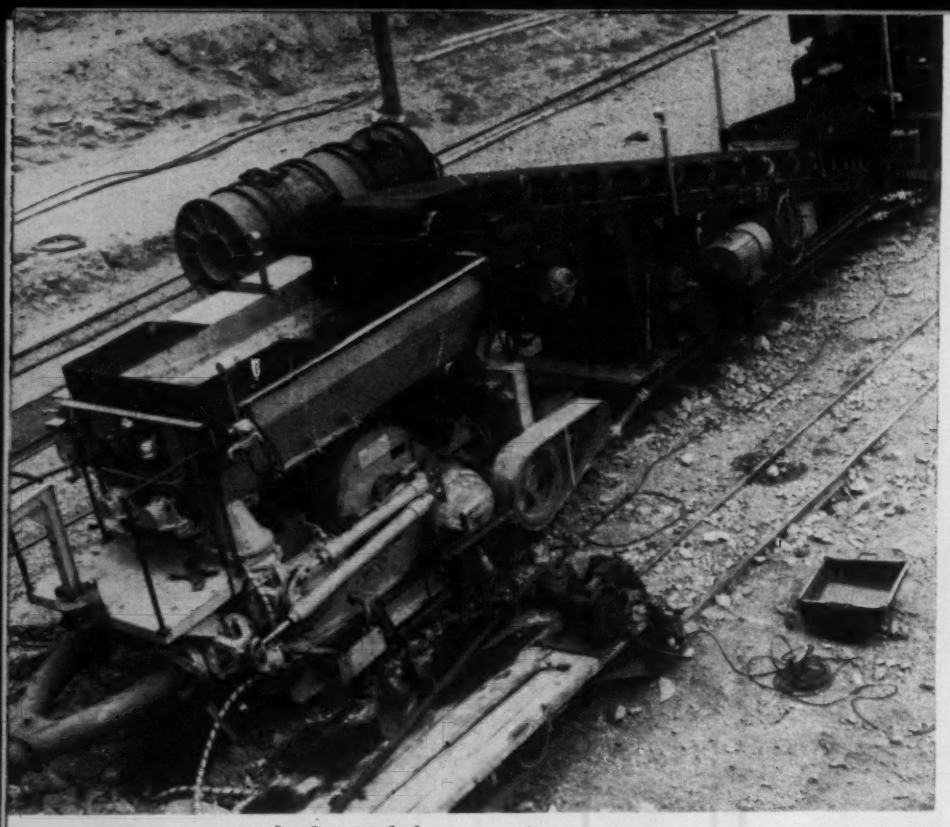
It provides economy-contoured camshaft and improved carburetion to give you extra power, extra miles from every gallon of gas. Also, there's a forged steel crankshaft, high quality steel and steel alloy valves, durable precision bearings, full pressure lubrication system, oil-bath air cleaner—all contributing to longer engine life and greater overall economy. This is the most experienced truck engine in the business, and it's ready to wade into your roughest work and keep you way ahead on fuel and maintenance expense. It'll pay you to check into it at your Chevrolet dealer's! . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

THRIFTMASTER 6 PERFORMANCE DATA

Gross Horsepower	135 @ 4000 rpm
Net Horsepower	115 @ 3600 rpm
Gross Torque, lb-ft	217 @ 2000 rpm
Net Torque, lb-ft	195 @ 2000 rpm
Piston Displacement	235.5 cubic inches
Bore and Stroke	3 9/16" x 3 15/16"
Compression Ratio	8.25 to 1

1961 CHEVROLET STURDI-BILT TRUCKS

CHEVROLET



Business end of 155-ft-long mixing train pumps concrete . . . mixed from dry batches and fed to

Down Deep, High Up Tunnel

Concrete crews working as deep as 4,475 ft underground, but still 9,000 ft above sea level, will finish the concrete lining of Denver's Harold B. Roberts Tunnel this August. Blue Mountain Constructors weathered the long Colorado winter to place 343,000 cu yd of concrete lining in the 23.3-mile tunnel under the Rocky Mountain Continental Divide.

The Denver Board of Water Commissioners is building the 10-ft 3-in., finished-diameter bore to provide the city with water from Dillon Reservoir on the Western Slope of the Rockies (ENR Oct. 29, 1959, p. 32).

Crews first placed 88,000 cu yd of concrete in the tunnel invert, creating a curved floor where the relatively flat bottom of the horseshoe-shaped rough bore had been. They are now finishing up the arch concrete that completes the circular lining.

Keystone of the lining operation inside the tunnel is a 155-ft-long mixing train, which rides the narrow-gage track in the tunnel. Here's how it works:

Concrete is dry batched in 37-cu-ft lots at plants near the portals, transported into the tunnel in rail-mounted batch cars, mixed by the paving train and pumped into place.

A batch car is pushed on to a dump-ramp at the back end of the train and workmen dump each dry batch of sand, cement and gravel onto a 30-in. inclined conveyor belt, which feeds the material into a 1¼-cu-yd surcharge bin or hopper. This bottom-dump hopper helps to maintain a steady flow of concrete through the mixing train. It provides temporary storage while train operators switch batch cars from a California switch on to the dump-ramp.

A 36-in. inclined conveyor belt carries the materials from the surcharge bin to a dual-drum mixer. Water and air-entraining agent are then added.

A third inclined belt conveys the concrete to a 2.5-cu-yd remix hopper mounted directly above the concrete pump. Twin 12-in.-dia screws in the hopper move the concrete forward, where it drops through a hatchway into a double-piston concrete pump.

The pump is arranged so that concrete can be pumped by either or both pistons through a wye connection to the 8-in. OD concrete pump line. Maximum capacity of the pump is 60 cu yd per hour. Its line is 260 ft long.

• **Invert concreting**—As the concrete was pumped into the invert forms, workmen vibrated it with a pair of hand vibrators. The fresh concrete was shaped to the curvature of the invert by a 10-ft-long drag-screed riding on the invert forms.

Both the screed and the concrete paving train were moved forward a few feet at a time by an electric winch.

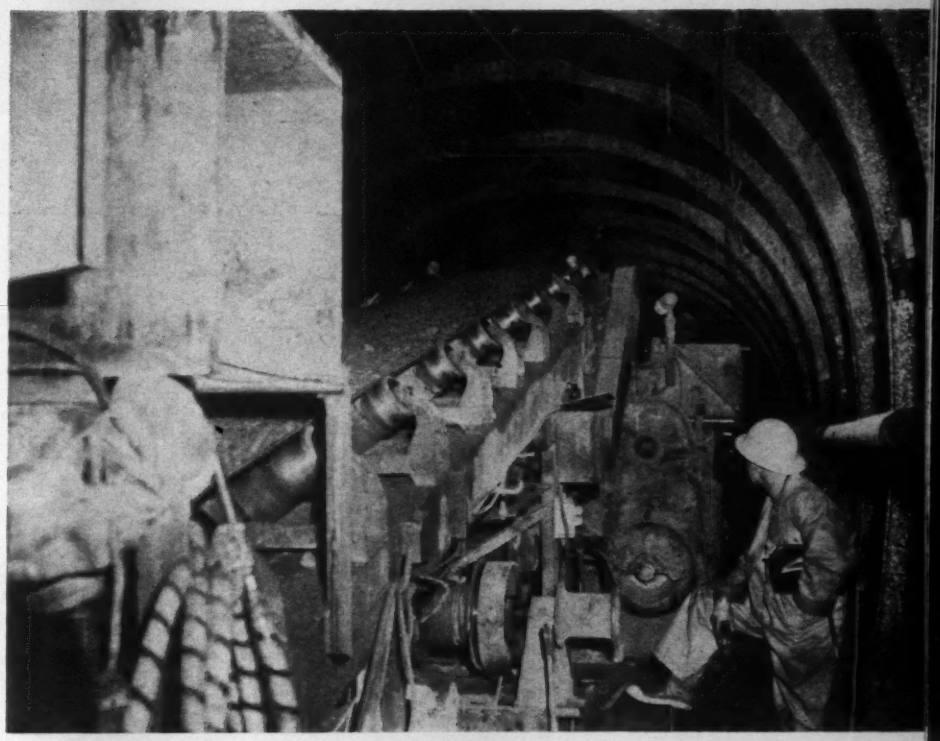
Adjustable rods bearing on the tunnel floor supported the 30-ft-long invert forms. Correct alignment and grade were maintained by telescopic jacks bearing against the tunnel ribs, and by grade-adjusting bolts in the rail assemblies carrying the traveler that handled the forms. About 35 sets of forms were kept at each of the two concreting operations.

Concrete was placed during the two day shifts. The graveyard shift set seven sets of invert forms (210 ft) for the morning shift. The supporting rods were loosened after the concrete had its initial set—two or three hours—and the forms were moved ahead after the concrete had cured for 10 hours.

At an average placement rate of 60 ft of invert per hour, concreting crews used a minimum of 20 sets of forms. With good luck, all 20 forms were filled in 10 hours, at which time the first set was moved ahead while other sections were being filled.

The invert forms were handled by a 68-ft-long self-propelled traveler riding on the rails along each row of supporting rods. The traveler cantilevers 23 ft past its running gear at each end so it can reach out and pick up a 30-ft section of forms from 10-hour-old concrete and pass it forward for resetting.

mixer from cars dumped at rear.



Invert concrete was belt-conveyed from mixer . . .

Lining

• **Barrel lining**—The collapsible forms for placing the concrete lining in the barrel of the tunnel are held in place by clamps and anchor bolts set in the invert concrete at about 5 ft c-c.

The traveler that handles the forms measures 33 ft between the front and rear carriages, which travel on the 24-in. gage rails. The steel-framed traveler is propelled by a constant torque hydraulic motor with chain drive to 14-in.-dia double-flange wheels.

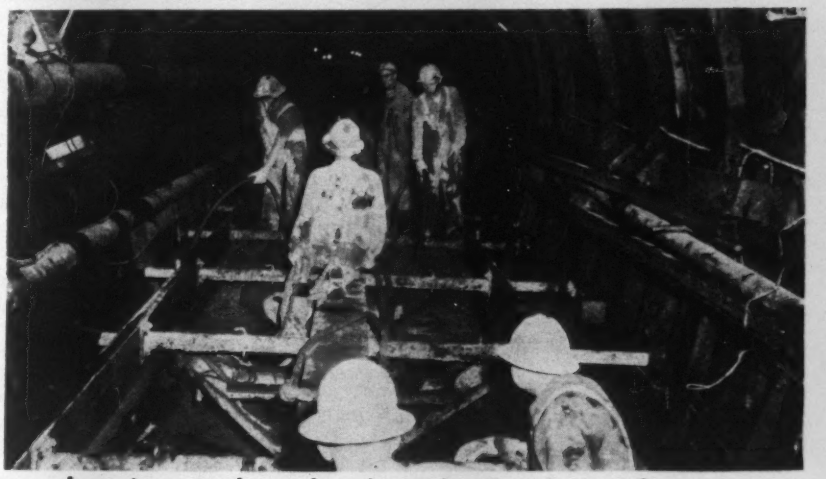
The three-section collapsible forms have a ¼-in. skin plate. They are hinged near the top at the quarter-points of the two semi-circles.

Two elevating rams raise the forms into position and lower them for moving ahead. Two push-pull rams collapse the forms for moving and lock them into position for placing the concrete. A third pair of leveling rams keeps the forms in proper position.

• **Dry batching beats cold**—Winter at elevation 9,000 ft means plenty of sub-zero temperatures, so both batch plants were insulated and had heated operators' compartments.

To avoid freezing, train loads of dry-batched concrete were made up at the plants and stored in the tunnel until needed. A typical train had eight bottom-dump batch cars. Each car has three 37-cu-ft compartments, which are

. . . pumped through 8-in. dia line (center) into forms . . .



. . . where it was vibrated and struck off with screed.

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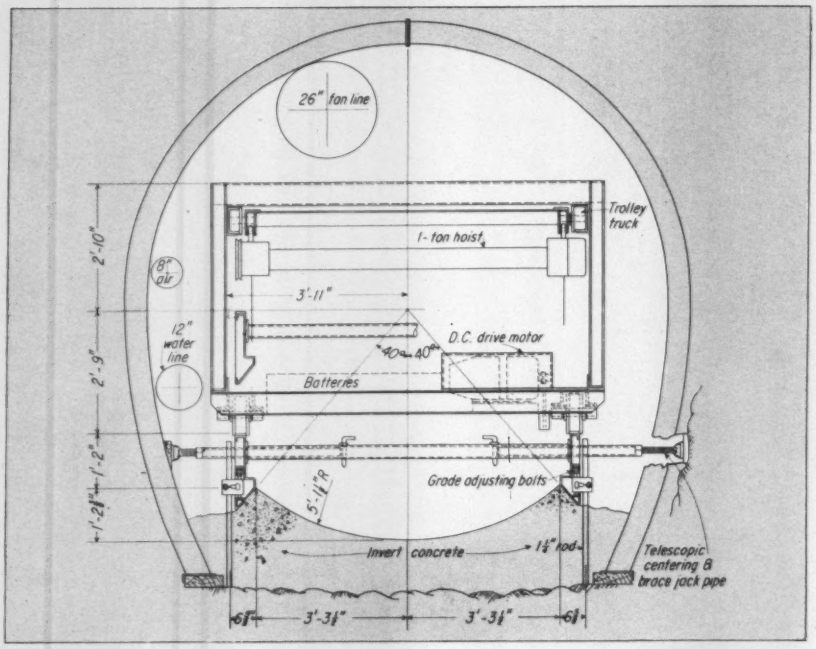
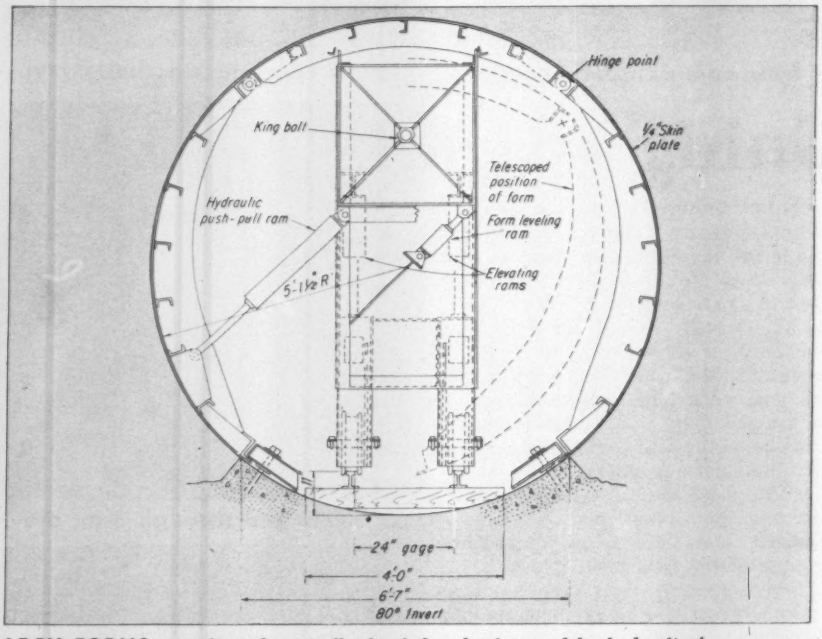
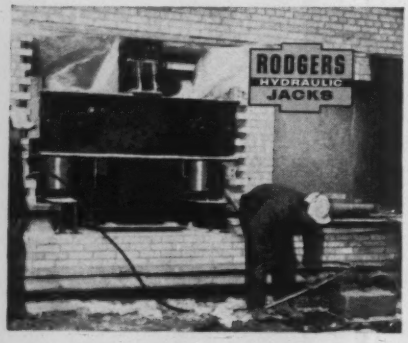


INVERT FORMS, supported on rods, are adjusted by traverse jacks and vertical bolts.



ARCH FORMS are adjusted vertically, leveled and telescoped by hydraulic forms.



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divided in two sections—one for cement, the other for sand and gravel.

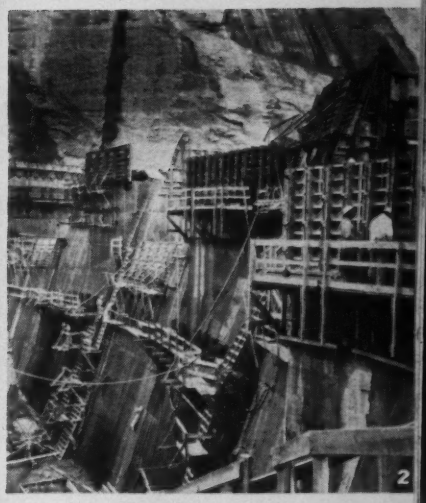
An air-entraining agent is added as the concrete is mixed inside the tunnel. A water-reducing agent is added to the sand at the batch plant.

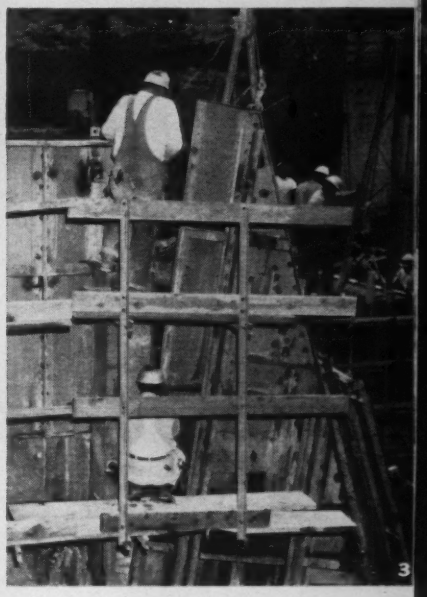
Aggregate stockpiles were heated by a forced-air method consisting of ductwork and covering. The heat source was grain-dryers of 250,000 to 500,000 Btu capacity.

Conveyors feeding the batch plants were not heated but were covered with galvanized sheeting.

Both batch plants are capable of 200 tons per hr, but they were run at 50 tph for the invert concrete and about 70 tph for the arch concrete. One plant can store 150 tons of aggregate and 2,000 bbl of cement; the other plant can store 450 tons of aggregate and 2,250 bbl of cement.

For the Denver Board of Water Commissioners, E. L. Mosley is project engineer and R. B. McRae is chief engineer. Blue River Constructors have the $45.8-million contract. T. F. Adams is project manager. Tipton and Kalmbach, Inc., designed the tunnel and are supervising construction.





BLAW-KNOX STEEL FORMS SHAPE GLEN CANYON DAM

re-used up to 100 times

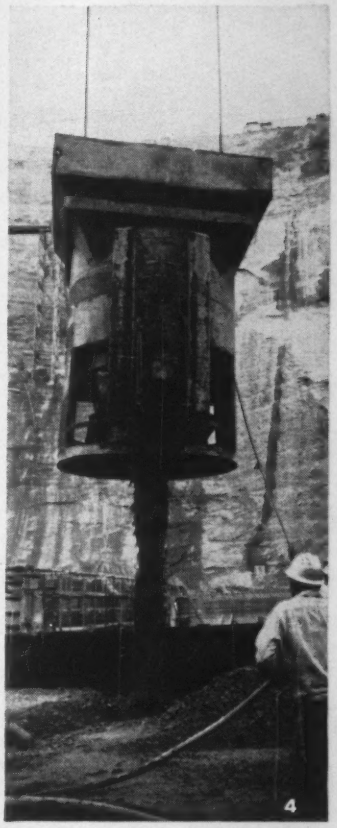
The $108 million Glen Canyon Dam, being constructed by Merritt-Chapman and Scott Corporation of New York, uses Blaw-Knox heavy steel forms to shape the 5 million cu. yds. of concrete being poured. In addition, 225,000 cu. yds. will be required for the power plant; 150,000 cu. yds. already have been poured, using Blaw-Knox forms, for the diversion and spillway tunnels.

Specially designed, steel, cantilever forms are used on this third-largest dam in the country. They will be re-used up to 100 times and thus become a major cost-reducing factor.

Concrete is poured in 7½-ft. lifts, many measuring 70 by 170 feet, and one lift of this size can be poured in eight hours using Blaw-Knox 12 cu. yd., hydraulically operated concrete buckets.

The forms are stripped and raised in as little as four hours, and nearly 2 miles of these will be used.

Wherever the big jobs are, you will find Blaw-Knox heavy steel forms being used to give the shape of things to come. Call Blaw-Knox steel forms consultation service early in your planning for important engineering help. Blaw-Knox Company, Pittsburgh 38, Pa., phone Sterling 1-2700.



1. This panoramic view shows the many Blaw-Knox steel forms being used during concrete placement on the upstream and downstream faces of the dam and the powerhouse foundation.

2. This view of the downstream face of the dam shows how Blaw-Knox steel forms are used in 7½-foot lifts.

3. Final bolts are tightened on a 70-foot form section on the upstream face of a lift while other workmen prepare to raise the key form on the transverse construction joint side. 1½-inch diameter bolts are removed from anchors after concrete has set. Forms then are stripped and raised into position for the next lift.

4. Four special, self-powered, hydraulically operated Blaw-Knox concrete buckets of 12 cu. yds. capacity are used to pour the concrete. Each bucket has a roller gate opening 4 feet by 4 feet and can be stopped in any position. Permits dribbling of concrete. These are the largest buckets in the world of this type. Concrete is moved from a 20-story high batch plant via cableway.

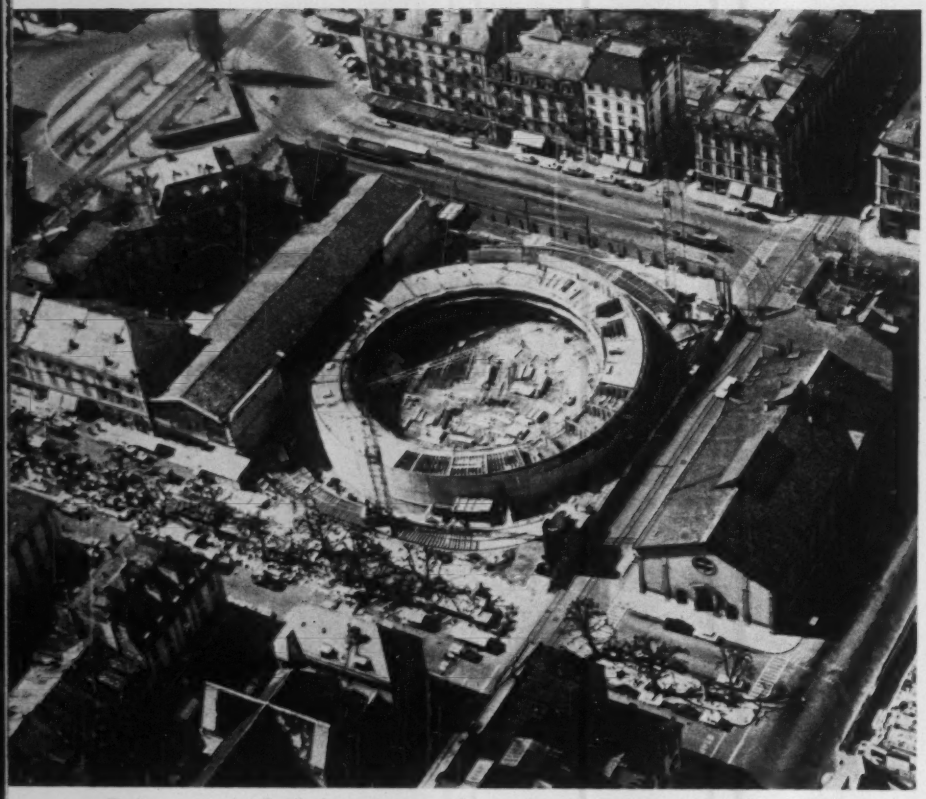
BLAW-KNOX

Steel Forms

BLAW-KNOX

Blaw-Knox designs and manufactures for America's growth industries: METALS: Rolling Mills • Steel Processing Lines • Rolls • Castings • Open Hearth Specialties • PROCESSING: Process Design, Engineering and Plant Construction Services • Process Equipment and Pressure Piping • CONSTRUCTION: Concrete and Bituminous Paving Machines • Concrete Batching Plants and Forms • Gratings • AEROSPACE: Fixed and Steerable Antennas • Radio Telescopes • Towers and Special Structures • POWER: Power Plant Specialties and Valves

Caissons Dig Out a Seven-Story



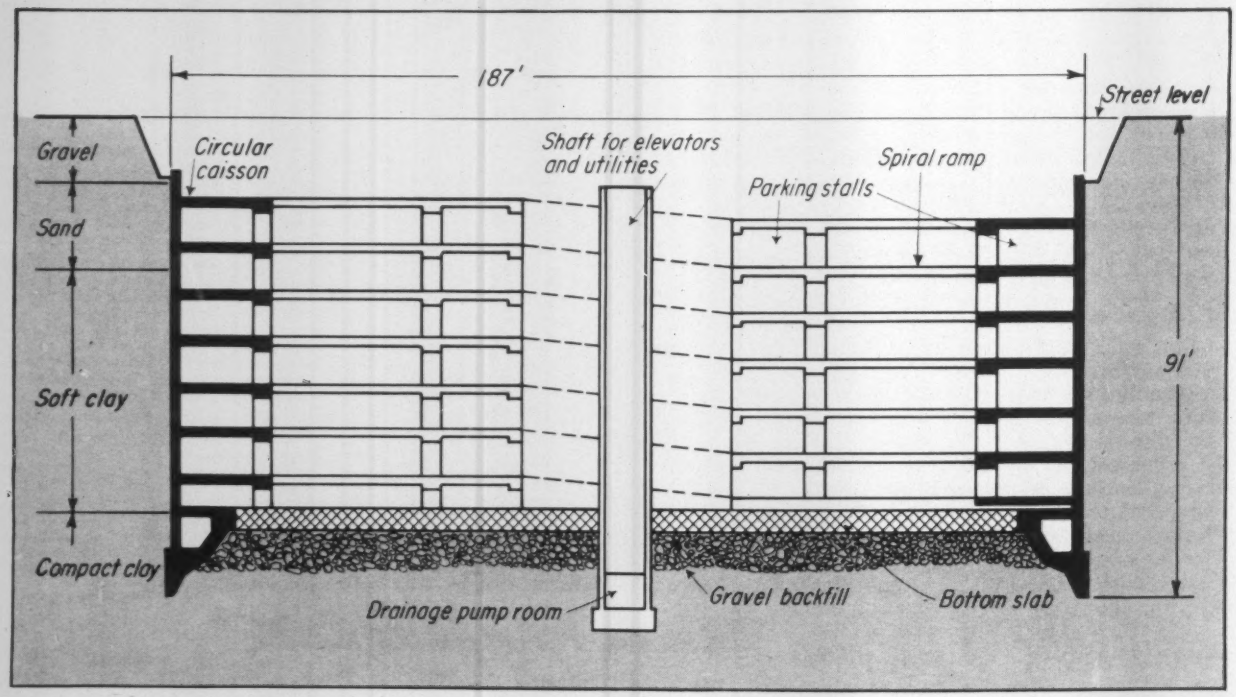
Caisson avoided sheeting and bracing on a constricted building site.

In the heart of Geneva's business section contractors are sinking a 187-ft-dia concrete caisson 91 ft to serve as the basement garage of a new seven-story office building.

The basement will contain seven levels of floors and provide 530 parking spaces. Since the superstructure will be square and larger in area than the basement some of its columns will be outside the caisson, and these will be supported on piles.

The engineers considered caisson construction the best method of excavation in the type of soil at the site—25 ft of water-bearing gravel and sand overlying a soft clay that merges into a compact clay at about a 70-ft depth. The alternative, a sheeted open excavation, raised to many doubts about soil settlement and movement that might endanger adjacent buildings and streets.

The basement will be framed with a spiral ramp. The ramp will carry two concentric rings of stalls for the cars. One ring of stalls is next to the outside wall, the other about 35 ft farther in. The space between the two rings will be the roadway. The outer ring of stalls, about 16 ft wide, is a part of the caisson, adding necessary stiffness during the sinking process to the exterior shell, whose thickness tapers from 16 in at the bottom to 12 in at the top. The re-



COMPLETED BASEMENT will be framed for a 530-car parking garage atop which a seven-story building will be erected. The seven-level spiral was sunk in two stages to a depth of 91 ft.

Basement

mainder of the interior framing will go up after the caisson is landed and the basement excavation complete.

The most important element of the caisson is the cutting edge. It is constructed entirely of reinforced concrete. Its stepped profile increases its bearing area—an added safety factor in controlling the rate of sinking. The cutting edge is about 10 ft high, and its diameter is about 8 in. greater than that of the caisson shell above.

A 4-in. annular space is thus created as the caisson sinks. This is progressively injected with a bentonite slurry to serve as a lubricant for the shell. The bentonite also waterproofs the excavation.

The piping system that supplies the bentonite slurry can also carry water to the cutting edge for jetting, if required. When the job is complete, cement grout will be pumped through these same pipes to replace the bentonite slurry.

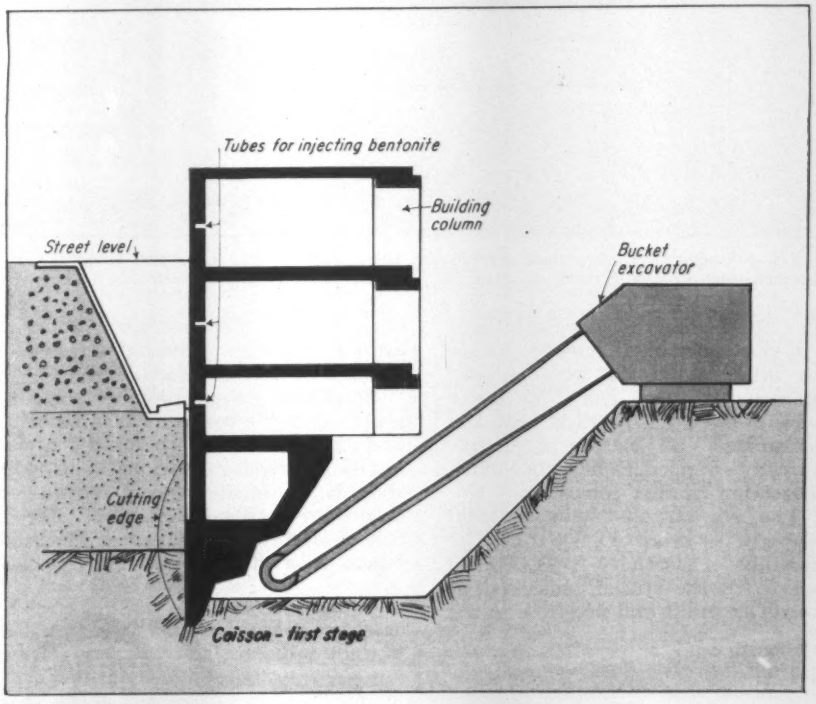
At the beginning of the job, the cutting edge was constructed in a prepared excavation about 10 ft deep. Then the caisson wall and three levels of floors were added. After the caisson had been sunk to ground level, the remaining four levels of basement floors and the corresponding height of exterior shell were constructed. At this point the caisson weighed about 22,000 tons.

While this weight proved useful in the sinking process, more important was the carefully controlled rate of excavation under the cutting edge. This was accomplished by a chain bucket excavator running on a circular track inside the caisson. The buckets discharged into trains of rail-mounted dump cars running on an adjacent circular track. These tracks were laid on the natural ground inside the caisson, which was progressively cut down as the excavation around the perimeter was deepened to the limit of reach of the boom on the bucket excavator. Two rail-mounted tower cranes were mounted outside the caisson on opposite sides of the site. These fed material to the top of the caisson and removed spoil from the center of the excavation.

Sinking of the caisson has averaged about 8 in. per day. Although the caisson has occasionally tilted away from the vertical, corrective excavation has brought it back to plumb. The cutting edge was reinforced to act as a beam between points as much as 50 ft apart.

Concrete was placed by four cranes with 90 ft booms operating on a track outside of the caisson. Slip forms were used for the shell.

The architect for the building is Fritz Jenny. A combine of three firms—Spinedi and Losinger—is the builder.



THE CAISSON SANK as bucket excavator dug under its leading edge. Once sunk to grade, it was built up to full height for maximum sinking weight.

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30,000 FEET OF BETHANIZED BRIDGE STRAND SUPPORTS 4-ACRE ROOF AT IDLEWILD

Architects and Engineers: Tippetts-Abbett-McCarthy-Stratton; Associate Architects: Ives, Turano and Gardner; General Contractor: Turner Construction Co.; Steel fabricator: Lehigh Structural Steel Co.; Steel erector: Lehigh Construction Co.

The new jet terminal for Pan American World Airways at New York's Idlewild Airport is topped by a 4-acre elliptical canopy roof. The long overhang of this cantilevered roof provides shelter to jet planes as they load and unload around the periphery of the building.

The canopy roof is framed with 32 tapered steel beams. These rest on columns near the midpoint, then soar free for an additional 114 ft. Each radial beam is supported by six 170-ft lengths of Bethlehem 2½-in.-diam bridge strand, made up into assemblies with anchor sockets at either end. The outer wires of the 1 x 147 strand have the bethanized "B" coating of electrolytically applied zinc, for extra protection against corrosion.

The six strands have a total strength per beam of 2,256 tons. The modulus of elasticity is 24,000,000 psi. With the strand tensioned, it exerts an uplift and prestress to the steel beams. The eccentric force exerted reduces bending stresses effected by the long cantilever.

Bethlehem Strand provides maximum strength per unit of weight and diameter. The bethanized coating is supplied in various coating weights, to meet varying requirements for corrosion-resistance. For full details, call the nearest Bethlehem sales office.

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Bethlehem Steel Company, Bethlehem, Pa. Export Sales: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

Biggest Paydozer Weighs 61 Tons

Power, size, weight and working capacity are among the key features found in Hough's Model D-500, newest and biggest of the Paydozer line of wheeled pusher-dozers.

The D-500 weighs 61 tons. Its power plant is a 700 hp V-12 Cummins diesel complete with turbo chargers, but it's geared down to turn out 600 hp. at 2,100 rpm so that it won't be overloaded even under heavy pushing. For engine protection, the unit includes two dry-type air cleaners, and all oil circuits are filtered.

The D-500 has a four wheel drive. Its power train includes a full power shift transmission, a three stage torque converter, power transfer differentials on both drive axles and heavy duty planetary final drive gearing in the wheel hubs.

The power range can be changed while the machine is in motion, and top speed in either direction is 15 mph. The power transfer differentials will automatically throw up to 38% more torque into a wheel that's capable of exerting more pull than the other on the same axle.

The power train on the D-500 is credited with being able to deliver about 80% of the peak drawbar hp through 75% of the entire driving range.

The standard dozer blade for the D-500 is 13 ft 4 in. wide, 4 ft 8 in. high. It has modified wings, stabilizer shoes, and six way hydraulice control. The blade can be raised to clear the ground by just over 4 ft and can be lowered to dig 2 ft below ground level. It has a total pitch angle of 45 deg and each side of it can be tilted up to 2 ft 4 in. The Paydozer has a single lift boom ram with a 7-in.-dia piston, two pitch rams with 6-in.-dia pistons and two tilt rams with 4-in.-dia pistons. All rams are double-acting, and they are powered by means of a 97-gpm pump that is run by an accessory drive. The hydraulic system is closed and pressure controlled.

The D-500 is a little more than 28 ft long with its blade in operating position, but its turning radius is less than 25 ft. The maneuverability is attributed to hydraulically activated articulated steering in which the front wheels determine directions of travel from a pivot point just behind the operator cab.

The steering axle oscillation is 30 deg., and according to the manufacturer, the rear wheels will track the front wheels at all times.

There are service brakes on all four wheels. They are air-over-hydraulic and are controlled by dual pedals on the cab floorboard. The parking brake is located in the transmission and is mechanical.

Standard tires for the rig are 33.5 x 33 26PR with 106-in. treads, but optional equipment includes two other tire sizes, one larger, the other smaller. Dry ballast, carried within the tires, helps stabilize the rig without increasing the load on the axles, since it is supported by the ground.

An automatic central lubrication system, offered as optional equipment, will interest a contractor concerned with reducing down-time. The system automatically lubricates all the machine's bearing surfaces except the engine fan and drive shaft universals.

Standard equipment includes a walk-in cab, safety glass windshields, front and rear windshield wipers work and travel lights and an adjustable seat. Swinging drawbar, tow hooks, pusher block, winch, cab heater and cab sides are available as optional accessories. The Frank G. Hough Co., Libertyville, Ill.

Roof Tiles Convert Wasted Space to Serviceable Area

Flat built-up roofs of hospitals, hotels, restaurants, and industrial plants can be protected and made serviceable with Promenade Tile, an asbestos-cement tile. It prevents sun from drying up felt oils of built-up surfaces, and protects against careless foot traffic. The tile is installed on a trowelled-on, cold asphalt-cement base.

Tiles can be cut with a hack saw, scored for breaking and fitted close around irregular shapes.

Standard size is 12 x 12 in., $\frac{1}{16}$ in. thick. Eaves are 2 ft long, 6 in. deep and overhang 2 in. Coving is 1 ft long and 6 in. high. Keasbey and Mattison Co., Ambler, Pa.

Hoist Makes Rear Dump Out of Flat Bed Truck

The Daybrook Hydraulic Hoist is designed for simple, inexpensive conversion of flat bed trucks to rear dump units according to its manufacturer.

The unit designated as the 7AF Low Mount Hoist is said to be self-contained. It carries its own sub-frame, a 7 in. lifting cylinder, a hydraulic pump and all connections.

The 7AF Hoist is designed for use on trucks with body lengths from 8 ft to 18 ft. The lifting capacity ranges from 13,100 lb to 24,500 lb depending on the length of the body. Daybrook Distributors, Bowling Green, Ohio.

Prefab Sub-Floor Shows Finished Hardwood Face

A single unit floor plank that combines sub-flooring and a hardwood face comes in thicknesses of $\frac{7}{8}$ and $1\frac{1}{16}$ in., and lengths up to 16 ft. Standard width is 12 in. The planks, called Plylumber, are factory assembled.

The three ply panels are cross-laminated under steam heated hydraulic presses with a phenol formaldehyde adhesive.

The red oak, pecan, or elm faces are finished after installation. Polatch Forests Inc., Lewiston, Idaho.

VIBER the contractor's most complete line of concrete vibrators!

Complete as a "full house" – that's the Viber line of concrete vibrators. Whatever the project, whatever the consistency of the mix . . . there's a Viber vibrator to do the job right. Standardized units with interchangeable parts make many models adaptable to a wide variety of job conditions . . . reduce your original investment. Simple, rugged Viber design makes servicing easy and keeps maintenance costs low. For answers to concrete vibrating problems, call your Viber distributor or write Viber Company, 726 South Flower Street, Burbank 13, Calif.

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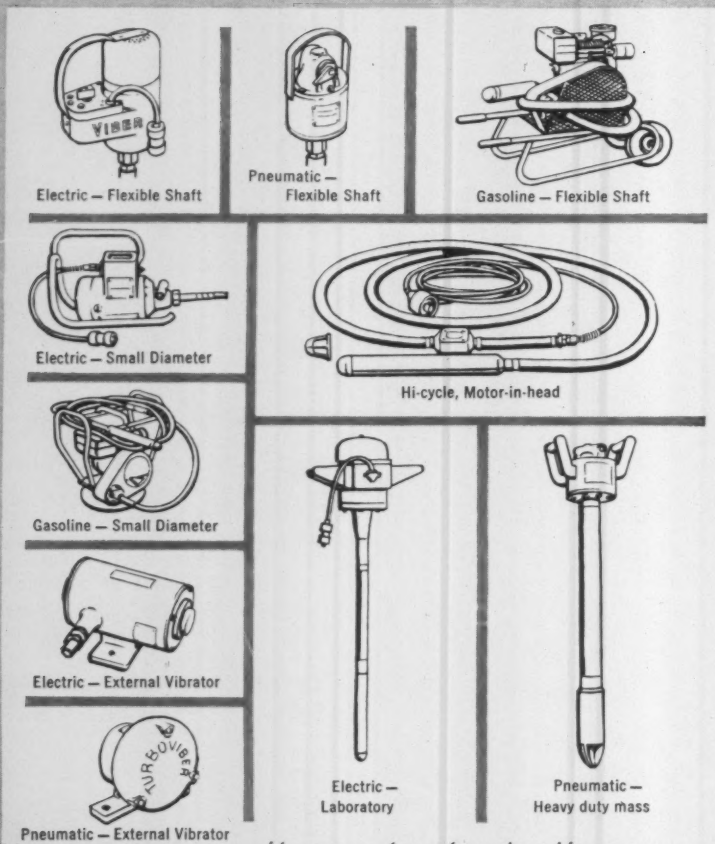

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Pack This Pistol and You Can Pick the Wall Pattern

The Pattern Pistol is a pattern spray gun for applying drywall textures, acoustic plasters, texture paints, metallic glitters, waterproofing, and many other materials with or without aggregate.

Spray patter is varied by selection of five different orifices drilled in a rotating plate that is attached to the nozzle exit.

Because the hopper is made of plastic, one man can handle the entire unit easily, according to the manufacturer.

The complete unit sells for $364.50 (fob mfgr). It includes pistol, motor, compressor, 50 ft of ½-in. hose, 25 ft of power cable and a rolling stand. Goldblatt Tool Co., 1910 Walnut St., Kansas City 41, Mo.

Fork-Lift Brute Refines Air and Oil with Delicacy

Even when operating under conditions where air pollution is at its highest, the Challenger 460A continues to give full time oil filtration and air cleaning, according to the manufacturer.

A full-flow oil filter, which is located in the return tube of the hydraulic tank, and a dry air cleaner with precleaner keep this 23-ton fork-lift clean inside.

Rated at 46,000 lb at a 48 in. load center, the new pneumatic-tire lift truck has a lengthened wheel base and 328 sq in. of brake lining.

All major engine components are placed topside. And from the running board the engine is bench high. Buyer has choice of gasoline or diesel engine. Power steering is supplied as standard equipment. Hyster Co., P.O. Box 847, Danville, Ill.

Submersible Pump Weighs 775 lb, Pumps 1,000 gpm

The Gorman-Rupp Co., manufacturers of pumps, has added an 8-in. submersible dewatering pump to its line.

Capacity of the Model S8A1 ranges from 1,000 gpm at 148 ft head to 2,700 gpm at 40 ft head.

The aluminum pump weighs 775 lb, is 31 in. tall and 28 in. in diameter. Strainer area is 480 sq in. with 1-in. square openings.

The pump's three-phase, 65-hp motor runs at 1,750 rpm. Each unit comes with 50 ft of cable.

Gorman-Rupp plans to follow this unit with 6 in., 4 in., and 2 in. models. The Gorman-Rupp Co., 305 Bowman St., Mansfield, Ohio.

Breaking stone out of solid bank was Michigan's chore when rain-soaked shot failed to shatter basalt ledge. Rugged machine withstood test with no loss in production.

Big rubber-tired Tractor Shovel economically excavates and hauls shot rock

Output, 3600 tons daily on 600 ft cycle, enables Idaho contractor's one Michigan to replace "standard" shovel-truck fleet

The 4½ yd Michigan Model 275A Tractor Shovel you see here is, by itself, doing all excavating and hauling of shot rock on a highway re-location job in northwestern Idaho.

Its production on 300 ft one-way hauls, bank to portable crusher, averages 3,600 tons per 20-hour day, *excavated and hauled*. Contractor, Grant Construction Company, Coeur D'Alene, is thus saving the costs of the 1¾ yd rock shovel and two six-yard rear dump hauling units normally used on such a project.

Michigan runs up 18 percent, 25-ft incline to charge crusher with 180 tons of stone per hour.

Breaks out rock from poorly shot bank

"Our first test with the Michigan was sure a rugged one," recalls Company President Jay Grant. "We had been using the machine to load crushed stone on another job. Never thought of trying it on this project (a $613,000, 5.3 mi relocation of U.S. 95 near Lewiston, Idaho). Then our Michigan Distributor (Western Machinery Co, Spokane) told us how other rubber-tired Michigans had been cutting costs on shot rock applications in other locations. So we brought it in, figuring it would dig and load most efficiently in rock shot to 12-inch size. We drilled the basalt shelf accordingly. However, rain hit us before we could detonate the dynamite charge . . . and the shot gave us uneven breakage *with most of the basalt remaining in the bank.*

"But that didn't stop our Michigan! It moved into the bank . . . and pried out the solid rock (weighing in-the-bank, 4900 lbs/yd) as if it were loose material. The way the Michigan handled that job was the 'acid test' as far as we were concerned. For one thing, it sure convinced us we wouldn't need the rock shovel. We were right . . . today the Michigan is charging the crusher at a steady rate of 180 tons per hour, 20 hours per day . . . *and there have been no delays due to downtime.*"

Of all Tractor Shovels, only the Michigan is built to withstand such abuse. It'll do the same kind of job for you. Best way to find out is to ask your Michigan Distributor for a no-obligation demonstration—nine models available with buckets from 16 cu ft to 6 cu yds. Also four models of Tractor Dozers—162 to 600 hp . . . and a full line of Tractor Scrapers—12½ to 32 cu yds. Same rugged construction throughout all Michigan machines.

Michigan is a registered trademark of

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GOODYEAR

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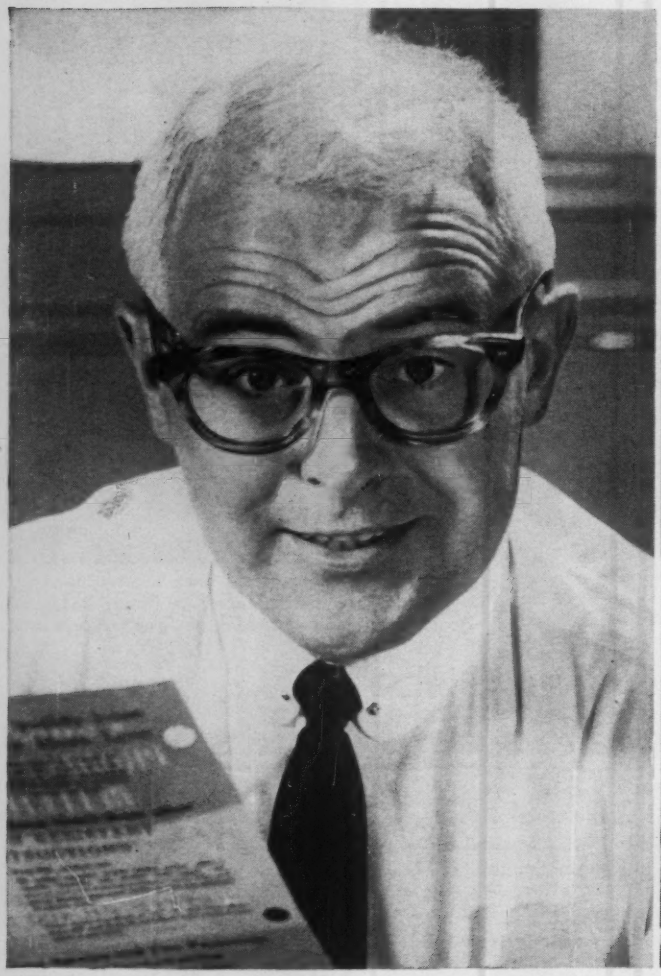

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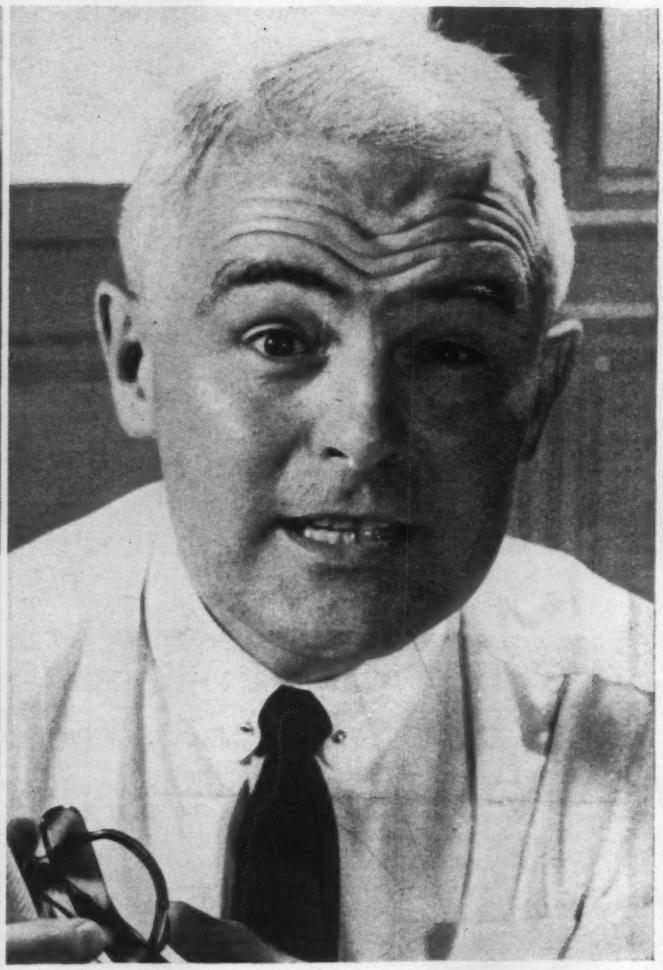

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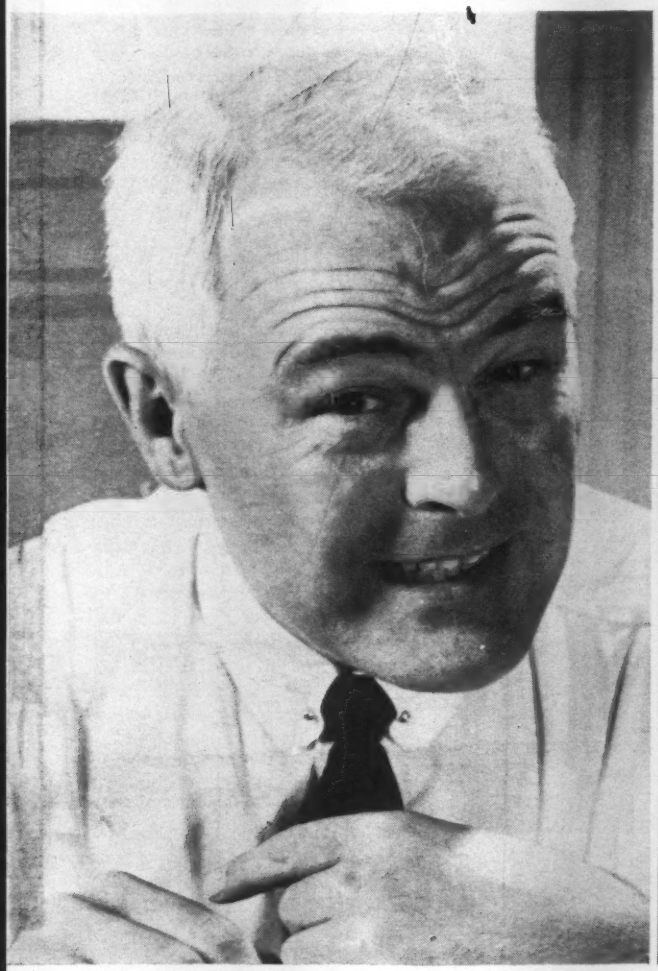
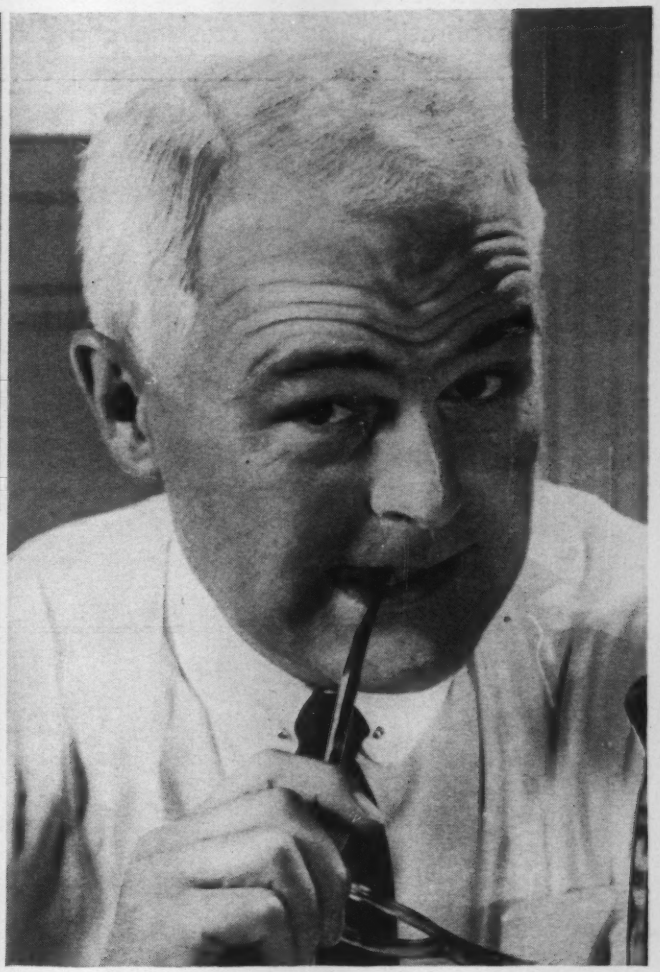
Has All the Right Answers!





TOUGH AS I NEED IT?
(For the extra ruggedness, extra dependability and extra safety of real quality hose—*Goodyear has the answer!)*

SPECIAL HELP WHEN I NEED IT?
(Call for the advice of an expert like the G.T.M. – Goodyear Technical Man – and *Goodyear has the answer!)*

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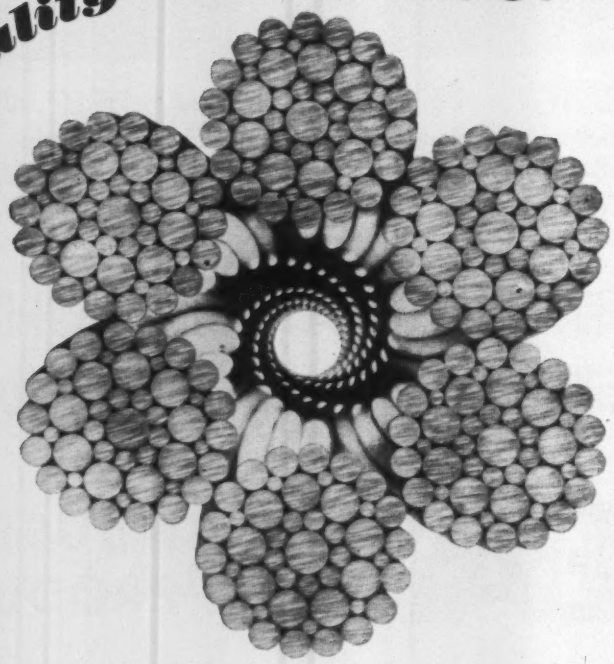


We put a lot of work into it—
You get a lot of work out of it

Consultant Takes ASTM Helm

Miles Nelson Clair of Brookline, Mass. is a detective in engineer's clothing. The man who last week became president of the American Society for Testing Materials is world known as the Sherlock Holmes of materials testing.

Mr. Clair is president of The Thompson & Lichtner Co., Inc., Boston engineers.

At 60, he is a tireless, thorough and imaginative engineer who loves his work enough to stay at it 70 hours a week and longer. Currently, he's been preparing six different reports simultaneously, each involving millions of dollars.

"I like my work; every day is something different," says Mr. Clair, whose desk when interviewed was cluttered enough with blueprints and other paperwork to make even the casual Sherlock Holmes look neat by comparison. But Mr. Clair readily demonstrates that he knows where everything is on his desk and can find it at a second's notice. Beneath his mild manner lurks a well-informed mind and the quick mental reactions of a trial lawyer.

"You may think this is a filing cabinet gone berserk," he said, "but I know just where to find anything."

It was as a boy of 11 in his native Lickdale, Pa., that Miles Clair was first exposed to the construction industry. He carried water on construction projects to help pay his way through school.

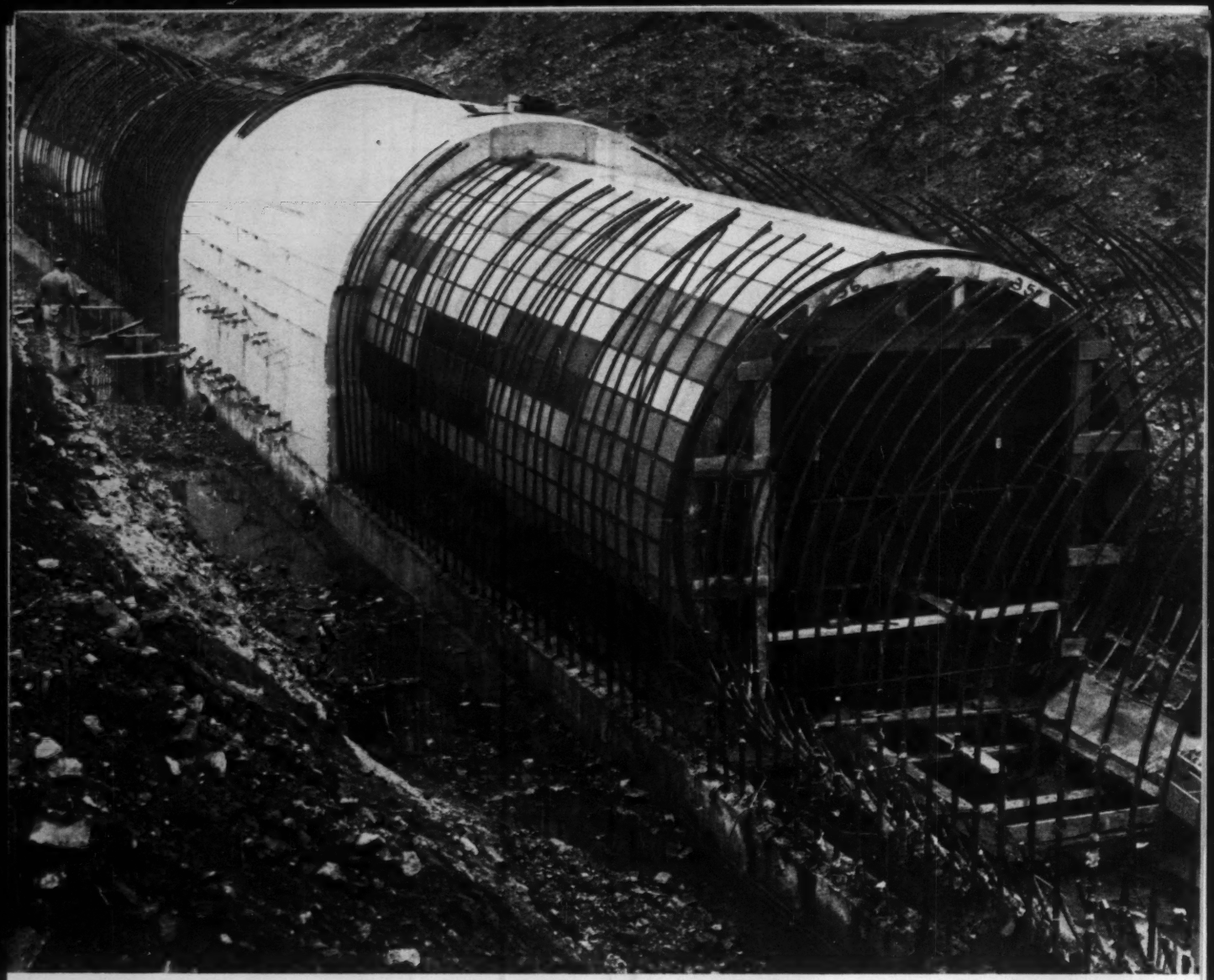
Mr. Clair received a B.S. in Engineering from Drexel Institute of Technology in 1921. In 1923 he received a master's degree in civil engineering. Later, Drexel conferred on him an honorary doctorate in engineering.

To Miles Clair, probably to more than any other engineer in the world, goes credit for developing methods of using precast and premixed concrete in construction projects. His company pioneered in the development of ready-mixed concrete procedures permitting trucks to supply concrete to projects in large quantities. Under his direction, Thompson & Lichtner Co., Inc., also originated many precasting methods.

The company does consultation, design, supervision and research in virtually all fields of engineering. Its consulting services cover foundations and structural design, cost comparisons, and supervision, inspection and material tests for construction. Another division of the company concentrates on produc-

(Please turn the page)

Sherlock Holmes of materials testing—Miles N. Clair.



New approach to tunnel jumbo: Hinged walers allow sides to swing in so jumbo can be lowered, rolled ahead, jacked up and re-set. For complete details on this time-saving development, write Symons Clamp & Mfg. Co., 4249 Diversey Avenue, Chicago, Illinois.

GPX® OVERLAID PLYWOOD helps Symons Clamp speed $400,000 sewer project

Jumbo can be stripped, set, poured — all in one day! New tunnel jumbo developed by Symons Clamp & Mfg. Co. using GPX High Density overlaid plywood can be stripped and re-set, ready for pour, in just one hour! Smooth plastic face on GPX helped make this speedy stripping possible. Re-useability of rugged GPX allowed non-stop use of tunnel form. Result: ¼ mile of circular, poured-in-place concrete was completed in three months ...well ahead of schedule.

Exceptional saving in labor, material. Since GPX could be re-used, no costly labor and material was required for additional forms. What's more, GPX can be used again after this job: its life is limited only by number of cuts and the care in handling.

Excellent results: smooth plastic face on GPX gives an exceptionally smooth surface to finished concrete. For full information on GPX High Density overlaid plywood—the concrete form that strips faster, lasts longer—write Georgia-Pacific, Equitable Bldg., Portland 4, Oregon.

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tion management in the industrial and marketing fields.

Mr. Clair says, "We know of no other consulting engineers in the U.S. who have a testing laboratory, do research, and design and supervise construction. We believe we can make adequate and comprehensive investigations (the company is frequently called upon to determine what has gone wrong in a project) only if we have at hand chemical laboratories, physicists, testing equipment, electronics men and those with a knowledge of structural arrangements."

His company operates from a high-ceilinged, converted, one-story building that does not even have a conspicuous sign on the front. When Mr. Clair became president, he closed all regional offices. What need for these sub-offices, he asked, when basically the employees of the company must go into the field to analyze a given situation?

The main office is modest, considering the demands placed upon Thompson & Lichtner by some of the world's largest firms. The headquarters is on a side street and both the interior and exterior belie the fact that this company has participated in billions of dollars' worth of projects.

Although the company is continuously involved in planning and investigations involving many millions of dollars, it seldom has more than 300 employees, usually an average of only 150.

For himself, as for the majority of his employees, Mr. Clair points out: "I'm a working man. I go out to the job." He also goes into the laboratories to conduct tests. "Besides being president, I still have to work," he explains.

Among his recent projects:

- Consultant on the U.S. Spanish bases.
- Consultant on foundations for the 5.2 mile-long Albemarle Sound Bridge, N. C., half of which went down in a hurricane last year.

. . . How Its New President Sees ASTM's Role

Miles Clair has been a member of ASTM since 1927 and is one of the original researchers whose work led to the establishment of its standards for concrete and cement.

He notes that ASTM is the only society in the world developing standards for materials and test methods that is not directly or indirectly under government control—and by far the largest and most fruitful. Founded in 1898, ASTM, he says, now has 10,500 members, plus another 6,600 committeemen who are not individual members.

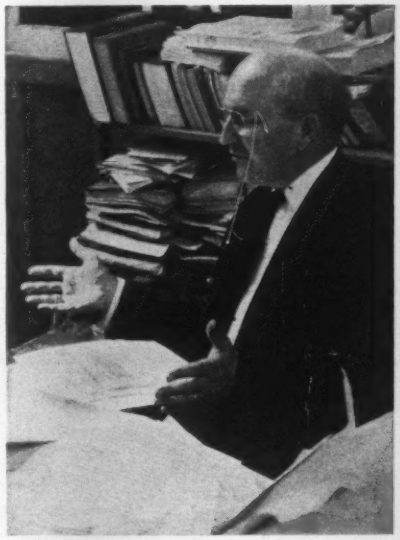
The society, he believes, should become ever more important in American economic and scientific life. There are now 87 technical committees in the organization, in addition to many subcommittees—altogether totaling more than 2,000 working committees. ASTM spends $1.5 million annually, not including research paid for by industry, government and individuals to supply data needed in the society's work.

"ASTM is one of the world's most workingest professional societies," Mr. Clair says. "At the annual meeting there were about 1,000 technical meetings."

The name of the organization was changed at the annual meeting to American Society for Testing Materials. The former name, Mr. Clair explains, didn't include the science of materials, a major portion of the society's work.

"Our society is made up of those who produce material, those who use it, and those who are professionally concerned, such as scientists and engineers," says Mr. Clair. "Out of all this comes mutual agreement as to what is wanted, what is needed, what is most practical. Last year, we established a new division on material science to provide a forum for those who want to deal with the basic concepts of materials.

"We are a free, uncontrolled group of people who get together on our own to arrive at a standard for materials and methods of testing materials. We don't, for example, just measure the tension in a piece of steel or the compression in concrete; but also what it is that gives these properties. If we understand this, we can then synthesize or create products that have the qualities we want—plasticity, elasticity, whatever it may be, down to the atoms. They are doing this now in petroleum, and other industries are following."



"ASTM is one of the world's most workingest professional societies."

ASTM has developed more than 2,700 standard specifications, test methods, recommended practices and lists of definitions.

All ASTM standards originate in one of the 87 technical committees. When need exists for a standard, a technical committee will either refer it to one of the existing subcommittees or create a task force to study the problem. Representatives of producers and consumers involved, together with general-interest participants, will help develop a standard.

A letter-ballot of the subcommittee is then taken. If it meets with substantial approval (the subcommittee usually tries for unanimity) the proposed standard is referred to the main committee, where it is again subject to further study and a letter-ballot. If this vote is favorable, the standard is sent to the ASTM Administrative Committee on Standards. This committee can approve the standard, or if it has been submitted at a time when the annual meeting is reasonably near, the society can act on it at this meeting.

At that time, authorization generally is given to canvass the entire membership for acceptance of the standard. When approval is received, the standard is published as a "Tentative," with request that those using it notify the originating technical committee of any exceptions or changes necessary to make the standard workable. After a trial period of at least one year, a Tentative can be adopted as a Standard.

At any stage, those with objections are heard. If the objections are valid, the proposed standard generally will be modified. Thus, there is a considerable amount of open discussion from the start to the time when a Standard becomes available to industry.

Are there adequate standards today for testing and for materials? The U.S., reports Mr. Clair, is far ahead of any other nation in the world. Yet there is room for progress.

"We must improve further our standards for testing and materials," he says. "There is a tremendous need in this country in these fields because new materials are being created at a rate never seen before."

Mr. Clair disagrees sharply with those who contend that standardization tends to stabilize product development. He says: "This is definitely not so. The truth is that immediately after a standard is established there is an intense effort both to raise the stringency of the tests and to improve the material. Someone fortunately always wants to do better in our society."

Because versatility counts

HENDRICKSON BROS. COUNTS ON MACKS

Macks move the earth—Hendrickson Bros. uses these versatile B-42S Mack dumpers on this earth moving project at Heckscher State Park, Long Island. Dependability makes Macks first choice with experienced operators.

On fast-changing Long Island, N. Y., Hendrickson Bros., Inc. takes on a unique "mix" of construction projects impossible for a less versatile organization. From its Valley Stream, Long Island headquarters, Hendrickson supervises operations ranging from storm sewer projects to major super-highway construction . . . from asphalt paving to involved railroad grade crossing eliminations in busy suburbs of Greater New York City.

Hendrickson's highly regarded reputation for "getting the job done" is due in part to its insistence on working with quality equipment. As Milton A. Hendrickson, President, puts it, "Construction jobs demand a lot of a truck. We use Macks because we're sure they'll do each job the way we want it done. To our way of thinking, an investment in a Mack is one that pays off."

Mack trucks pay off because of Balanced Design—the exclusive Mack concept in which every major component is *Mack built* to work together for the highest efficiency and long life. Engines, clutches, transmissions, axles, drives — all major components are *made by Mack* for Mack trucks alone . . . made to the highest standards of the industry to work together for maximum efficiency and long life.

Whether you use one truck or dozens, you'll find a profitable difference in using Macks. Your Mack representative is qualified by knowledge and experience to help you determine the Mack models that most economically meet your trucking needs. Mack Trucks, Inc., Plainfield, New Jersey. Mack Trucks of Canada, Ltd., Toronto, Ontario.

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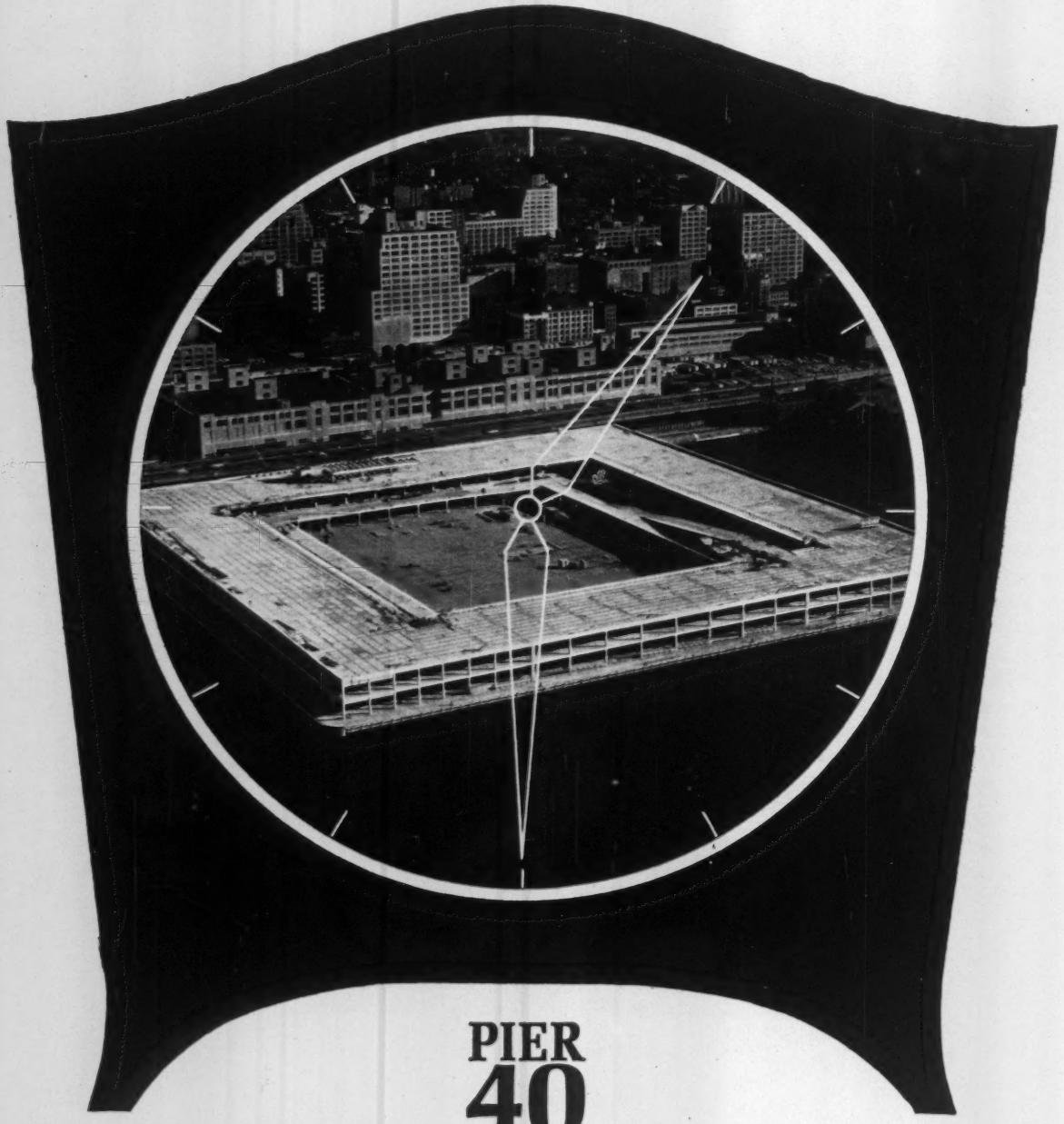
TRUCKS

Good going or bad—Speeding down a stretch of new parkway or slogging off highway to the dump site, Macks are assured maximum traction, thanks to the exclusive Mack Balanced Bogie with automatic Power Divider interaxle differential, an example of all-around Mack versatility.

time is money ■ Incor saves you time ■

Pier 40 Superstructure (Holland-America Line). Owner: City of New York, Department of Marine and Aviation; Architects and Engineers: Roberts & Schaefer Co., Inc.; General Contractor: Corbetta Construction Co., Inc. (all of New York).



PIER 40

830,000 sq ft in 9 months—with precast concrete and Incor

Construction of the superstructure on Manhattan's precedent-setting, 15-acre Pier 40 represented a major coordination feat for the contractor. More than 12,000 precast members and prestressed members in hundreds of shapes and sizes were produced on precise schedules—nearly all cast at the site. Again, Incor 24-hour cement proved its worth. Used exclusively for the cast-in-place concrete as well as the precast units, it enabled the contractor to accomplish the job on schedule, and with a considerable saving in forms.

Let Incor do the same for you. Specify it in your next project and make time work for you. With Incor on the job, it's earlier than you think.

AMERICA'S FIRST HIGH EARLY STRENGTH CEMENT

INCOR®

LONE STAR CEMENT CORPORATION, NEW YORK 17, N.Y.

Tennessee Runway Extension Contract

Low prices on 480,000 cu yd of excavation helped land this $676,000 airport job

Construction of this 1,500 foot long runway extension for jet fighters at McGhee-Tyson Airport, Knoxville, will cost the taxpayers $675,899. Malone Bros. Construction Co., Inc., of Greenville, Tenn., low, was 7% under second low, Ruth Construction Co., New Market, Tenn., and 15.5% below the high. Bidding only $0.23 a unit for 480,000 cu yd of common excavation, the largest single cost item, Malone Bros. got off to a good start by pricing a yard $0.05 under the second low, and $0.17 under the high.

The extension will be added to the existing 7,500 by 150 foot runway and connecting 70-ft-wide taxiway. The contract also provides for a holding pad for 10 in. rigid pavement. Prices for 44,200 sq yd of 10 in. concrete pavement ranged from $4.95 a yard, bid by the low and second low, to a high of $5.41. Schedule B, one of two alternative base bids, called for some flexible and some concrete pavement. Schedule A, for concrete pavement only, was not priced by any of the three contractors.

About 800 ft of existing pavement will be overlain with a crushed stone base and surfaced with 3 inches of asphaltic concrete. In addition, a 1,000 ft double-bituminous surface treatment pavement overrun will be placed at the end of the runway extension. It will require about 7,800 gal of bituminous material at $0.16 a gal. The high bid was $0.18 a gal. Aggregate for double-bituminous treatment drew prices ranging from $3.14 to $4.50 a unit for 420 tons.

The entire runway and overrun will be remarked and a new 20-ampere series high intensity lighting system will be installed.

Minimum wage rates set by the Department of Labor, Determination No. Y-14, 618, include: bricklayers, $3.60/hr; cement masons, $2.50; electricians, $3.15; carpenters, $2.875; bituminous surface distributors, $2.35; laborers, $1.775/hr; pipe layer & air tool operator, $1.925; trenching machine operator (over 18 in.), $2.725; and truck drivers, $1.895-$2.35/hr.

The bidding included:

1C Malone Bros. Const. Co., Inc., Greenville, Tenn. $675,899
2 Ruth Const. Co., New Market, Tenn. 721,858
3 Zephyr Const. Co., Brooklyn, N. Y. 780,357
EE U. S. Corps of Engineers, Nashville, Tenn. 845,977

Schedule B—Runway & Taxiway Extensions Using Flexible and Concrete Pavement

Bids: 3-15-61 Items	Unit	Quantity	Unit Prices 1C	2
Excavation & embankment				
Exc, common	cy	480,000	$0.23	$0.28
Borrow, common	cy	168,000	0.25	0.37
Exc, conc pavement	cy	2,400	1.50	1.50
Storm drains				
Pipe, 24"	lf	540	9.50	10.20
18"	lf	400	6.00	6.27
Subdrains	ls	job	800.00	1,150
Basin, stilling	ls	job	445.00	475.00
Inlet, #1	ls	job	548.00	490.00
#2	ls	job	839.00	820.00
#3	ls	job	477.00	300.00
MH, #1A	ls	job	1,251	855.00
#3	ls	job	1,170	770.00
Removal, existing inlet, #2	ls	job	50.00	40.00
MH, #3	ls	job	50.00	40.00
Graded crushed stone base course				
Base course	cy	14,550	4.75	5.00
Bituminous pavement				
Bit prime coat	gal	6,000	0.16	0.165
tack coat	gal	3,500	0.16	0.20
mix for surf course	t	2,850	4.95	4.75
mat for surf course	gal	44,500	0.12	0.15
Concrete pavement				
Conc pavement, 10"	sy	44,200	4.95	4.95
Perimeter fence				
Fence, existing, remove & relocate	lf	2,500	0.60	0.65
new, perimeter	lf	2,750	0.60	0.65
Gate, existing, remove & relocate, 14'	ls	job	50.00	50.00
Electrical work				
MH, #1 through 6	ea	6	1,090	995.00
Pull boxes, #1 through 13	ea	13	594.45	500.00
Duct bank, encased				
12-way conc, 12, 4" ducts	lf	280	9.03	8.60
9-way conc, 9, 4" ducts	lf	520	7.09	6.75
6-way conc, 6, 4" ducts	lf	130	6.21	5.91
2-way conc, 2, 4" ducts	lf	325	2.71	2.58
Markers, duct bank	ea	40	5.52	5.25
Trench, earth, for 1, 2, 3, or 4 airfield lgt cables & backfill	lf	21,000	0.42	0.40
for 5, 6, 7, or 8 airfield lgt cables & backfill	lf	1,300	0.86	0.50
Cable, 5,000 v, 1/C #8, instl in earth trench, cond or duct, without plugs & receptacles	lf	30,000	0.045	0.042
w/plugs & receptacles	lf	24,000	0.062	0.059
Markers, cable, for airfield lighting	ea	225	5.52	5.25
Counterpoise	lf	36,000	0.11	0.11
Cable, existing, pull out of cond or duct	lf	2,200	0.055	0.042
temporary, instl	lf	1,500	0.062	0.059
Lgt, airfield, operation & control equip	ls	job	1,379	1,314
& transformers, remove exist from runway	ea	75	4.63	4.41
& isolating transformers, remove exist from taxiway	ea	23	6.82	6.49
Conc bases, new, runway, marker lights	ea	23	52.50	50.00
threshold lights	ls	job	3,670	3,495
taxiway, tp M-1 marker lights	ea	41	52.50	50.00
Instl, runway marker lights, tp C-1 on new conc bases	ea	23	22.78	19.16
tp C-1 on exist steel bases	ea	75	22.78	19.80
taxiway marker lights, tp M-1 on new conc bases	ea	41	22.78	19.16
threshold lights, tp B-25 semi-flush	ea	44	22.78	22.78
tp MB-2 elevated	ea	28	22.78	19.16
temporary	ea	10	28.63	25.63
MH & equip, exist, remove	ea	10	97.70	93.60
Cable leads, 5,000 v, 1/C #8, in earth, trench, cond, or duct, w/plugs & receptacles, fabricate & instl	ea	100	28.70	28.70

Schedule C—Seeding

Seeding	acre	85	175.00	144.00

Schedule D—Blast Pad and Paved Runway Overrun

Bids: 3-15-61 Items	Unit	Quantity	Unit Prices 1C	2
Graded crushed stone base course				
base course	cy	3,200	4.75	5.26
Bituminous pavement (central plant, hot mix)				
Bit prime coat	gal	900	0.16	0.20
tack coat	gal	500	0.16	0.25
mix for surf course	t	270	5.45	5.25
mat for surf course	gal	4,200	0.12	0.18
Double bituminous surface treatment				
Bit prime coat	gal	5,000	0.16	0.17
mat for double bit treatment	gal	7,800	0.16	0.16
Aggr for double bit treatment	gal	420	4.50	3.14

Schedule E—Overrun Barrier

MH, #7	ls	job	1,868	1,784
Pull boxes, #18 through 30	ea	13	324.45	550.00
Duct bank, 1-way direct burial, 1, 4" duct	lf	5,000	1.35	1.28
Trench, earth, for 1, 2, 3, or 4 runway overrun barrier cables & backfill	lf	5,500	0.42	0.40
Cables, instl in earth trench, cond or duct, 5,000 v, 1/C #4	lf	10,300	0.67	0.63
600 v, 3/C #19/25	lf	400	0.59	0.56
5/C #19/25	lf	19,000	0.65	0.61
7/C #19/25	lf	250	1.03	0.98
Markers, cable, for runway overrun barrier cable	ea	30	5.52	5.25
Pole line, primary, equip	ls	job	1,032	982.63
Instl govt furn equip & related work	ls	job	9,177	11,000
Duct bank & embedded anchors in paved overrun area	ls	job	45,552	49,512

Schedule F—Runway Marking

Binder, for reflective painting	100 sf	1,140	4.48	3.30
Reflective media for reflective painting	100 sf	1,140	8.48	8.30
Painting, non-reflective	ls	job	460.00	550.00

Schedule G—Holding Pad

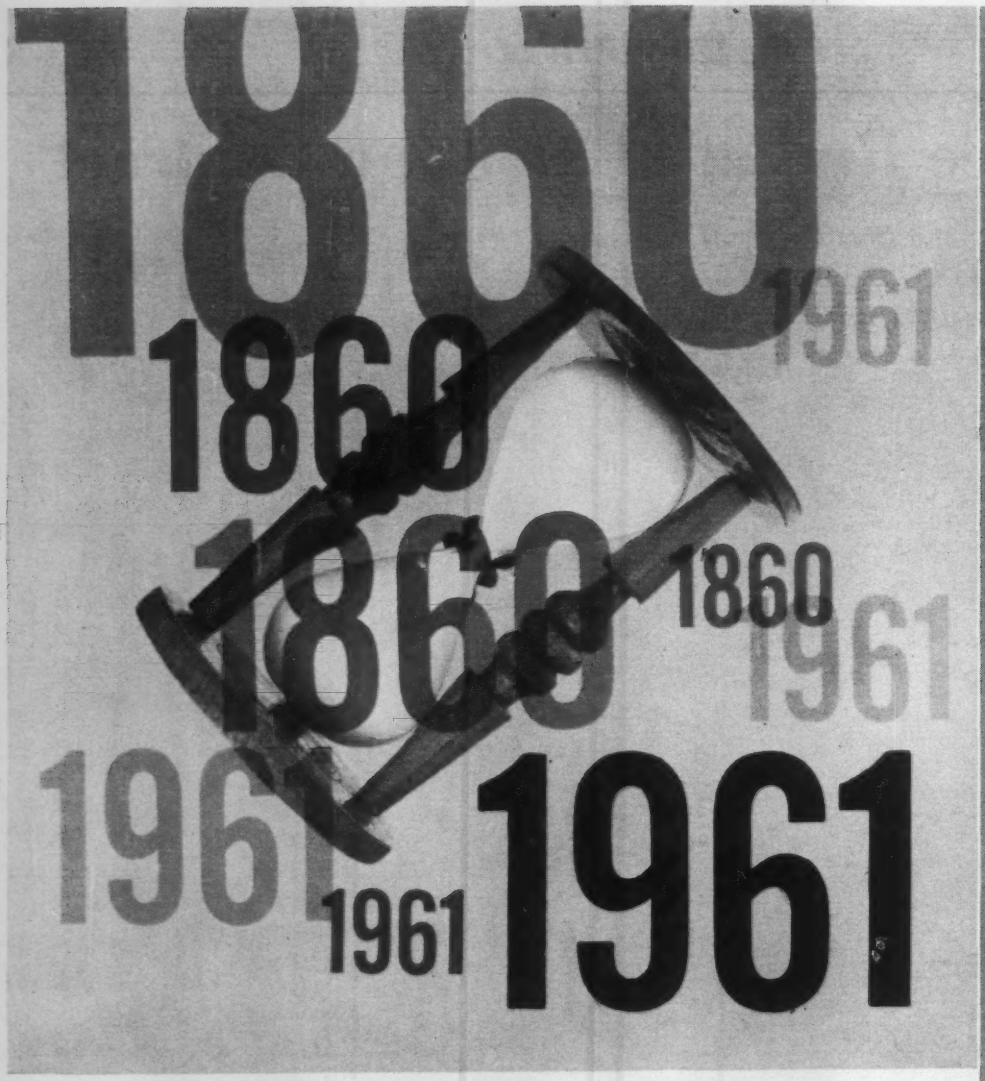
Concrete pavement				
Conc pavement, 10"	sy	6,580	5.25	5.25
Graded crushed stone base course				
Base course	cy	720	4.75	5.26
Electrical				
Trench, earth, for 1, 2, 3, or 4 airfield ltg cables	lf	600	0.42	0.40
Cable, instl, 5,000 v, 1/C #8, w/plugs & receptacles	lf	650	0.062	0.059
Markers, cable	ea	3	5.25	5.25
Counterpoise	lf	650	0.11	0.11
Conc bases, new, taxiway, tp M-1 marker lgt	ea	8	52.50	50.00
instl	ea	8	22.78	19.16
Cable leads, 5,000 v, 1/C #8, in earth, trench, cond, or duct, w/plugs & receptacles, fabricate & instl	ea	10	28.70	27.80

Completion time: 360 calendar days
Liquidated damages: $150 per day

ENR Construction Cost Index (1913=100) 20-cities average —834.16

Correction

Where Waterworks & Sewerage Dollars Go (ENR Mar. 23, 1961, p. 106) carried forward two errors in original data into the published table. Please correct Water Supply, Treatment Plant, Metal products, Pipe & Fittings, Cast Iron (shown as 136.7) to 36.7. Also under Sewage Disposal, Collection & Other, All other materials, Roofing (now blank) please insert 0.2.



WHEN BUYING HYDRANTS LOOK FOR A MANUFACTURER WITH AT LEAST 100 YEARS' EXPERIENCE

Age has its advantages when you are dealing with fire hydrants, because hydrants must provide many years of reliable service. When a manufacturer has been in business 100 years or more, the quality of his product is well known.

R. D. Wood Hydrants have stood the test of time. There are more than a million of them in use right now. This says a great deal for the excellence of the product and the reliability of service.

When you deal with R. D. Wood (over 100 years in the hydrant business) you have the comfortable feeling that we will still be around when your equipment needs service or even replacement.

Conform to A.W.W.A. specifications

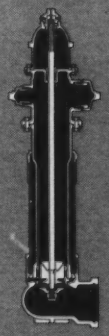
R. D. WOOD COMPANY

Public Ledger Bldg., Independence Square, Philadelphia 5, Pa.

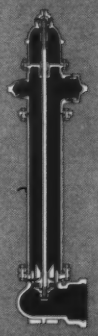
Established in 1803

Manufacturers of "Sand-Spun" Pipe (centrifugally cast in sand molds)

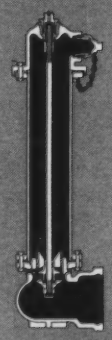
THIS IS THE R. D. WOOD LINE



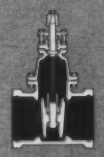
R. D. Wood Mathews Modernized Hydrant with replaceable barrel.



R. D. Wood Mathews Flange Barrel Hydrant . . . dry head construction keeps it operating in every kind of weather.



R. D. Wood Swivel Joint Hydrant can be faced in any direction.



R. D. Wood Gate Valve—bury it and forget it.

Materials Prices

Monthly Market Quotations by ENR Field Reporters

See following ENR Issues for OTHER PRICES:

- Iron & Steel Products, Pipe: Last, June 15; Next, July 13.
- Wood Products, Glass, Explosives, Chemicals: Last, June 22; Next, July 20.
- Clay Products, Limes, Plaster, Paint, Roofing: Last, June 29; Next, July 27.

CEMENT, AGGREGATE, READY MIXED CONCRETE - F. O. B. CITY

Item	Quantity	Unit	Atlanta	Baltimore	Birmingham	Boston	Chicago	Cincinnati	Cleveland	Dallas	Denver	Detroit	Kansas City	Los Angeles	Minneapolis	New Orleans	New York	Philadelphia	Pittsburgh	St. Louis	San Francisco	Seattle	Montreal	†Toronto
Cement, Port., bulk	CL	bbl.	$3.80a	$3.91a	$3.50cf	$4.53ap	$4.02ag	$4.34c	$3.89	$3.46a	$4.39a	$3.91agq	$3.97a	$4.68ch	$4.17a	$3.65b	$4.20a	$4.01#ae	$4.62bj	$4.09a	$3.85c	$3.75ag	$2.96de#	$3.84t
paper	"	"	4.30a#	4.42a	4.43c	5.83ip	4.52ag	4.84c	4.77#	3.90a	4.89a	4.24a	4.52a	5.12ch	4.68a	4.17b	4.71a	4.51#ae	5.65bjk	4.59a	4.42c	4.47#a	3.26#de	4.20i
mortar	"	"	3.62a#	3.56a	.....	4.90imp	4.15g	4.32c	4.19#ae	3.78a	4.89	3.29a	4.30a	5.60c	4.26a	3.97b	3.77a	3.63#e	5 00bjl	4.29a	4.86c	4.65a	3.31#de	4.20i
Gravel, 1½"	"	ton	2.25a#	2.80a#	2.53ns	3.00qsz	3.78#e	2.29#cu	2.25ae	2.55#a	1.95#	2.50#abm	.....	2.56#at	2.70#ae	2.61b	.....	1.95#a	2.68#aqv	3.50#as	2.02	4.25#bm	1.90#a	2.40
¾"	"	"	2.50a#	2.80a#	2.53ns	3.00qsz	3.78#be	2.34#cu	2.25ae	2.60#a	2.15#	2.50#abm	.....	2.76#at	2.70#ae	2.61b	3.20bk	1.95#a	2.68#aqv	3.50#as	2.02	4.25#bm	2.15#a	2.40
Sand	"	"	2.00a#	2.25a#	2.13ns	3.00qsz	4.13#be	2.44#cu	1.75ae	1.65#	1.42#b	2.16#abm	1.70#a	2.41#at	1.60#ae	2.16#b	2.30bkw	1.55#a	3.08#aqv	2.50/3.50#as	2.12	4.25#bm	2.40#a	2.05
Crushed stone, 1½"	"	"	3.10s	2.85a#	2.75s	1.75qsz	3.95#be	2.55#cu	2.70fy	2.57	.....	2.80#abm	2.10#a	2.41#at	4.00#ae	.....	2.85blbb	2.00#a	2.00#aqv	1.75js	2.17	4.50#bm	1.90#	2.40
¾"	"	"	3.10s	2.90a#	2.75s	1.85qsz	3.95#be	2.74#cu	2.70fy	2.77	3.00#x	2.80#abm	2.10#a	2.46#at	4.00#ae	.....	2.85blbb	2.30#a	2.00#aqv	1.75js	2.17	4.50#bm	2.15#	2.40
Crushed slag,* 1½"	"	"	3.90r	2.05a#	1.95d	.....	2.25#e	1.80u	2.30#f	.....	.....	3.15aqaa	.....	.....	.....	1.65d	.....	2.25#a	2.10w	1 80	.....	.....	2.00	2.40
¾"	"	"	3.90r	2.00a#	2.05d	.....	2.25#e	1.80u	2.30#f	.....	.....	3.50aqaa	.....	.....	.....	1.75d	.....	2.35#a	2.10w	1.85	.....	.....	2.00	2.40
Concrete block, 8"x8"x16"																								
Sand/gravel	TL	ea	0.19o	0.18a	0.19	0.24o	0.26#e	0.19o	.....	.....	0.25	0.24u	0.22a	0.175f	0.20q	0.25r	0.276no	.....	0.22rx	0.26#o	0.24	0.288s	0.20	0.26
Lt. wgt. agg	"	"	0.22o	0.18a	0.19	0.305ao	0.26#be	0.25ao	0.24f	0.255	0.27ao	.27#au	0.27c	0.25	.....	0.25	0.32lō	0.20	0.22rx	0.32#co	0.28cl	0.384cs	0.28t	0.30cu
Concrete, ready-mix'r		cy	13.00g	13.50ou	14.75q	15.00q	13.00-13.50e	15.00gr	17.25u	11.50x	11.90	15.50eaa	13.50	12.46hlx	14.55f	14.25o	17.60ay	13.90z	16.15o	13.65/14.10q	12.50ew	14.70j	10.00ek	11.75q

Delivered. * F.o.b. plant. ** Add 4% sales tax ## Add 2% Intrastate sales tax. R Revised. † Plus 6% Mun & Prov tax.

CEMENT: •a Less 10¢ disc. 15 days. •b Less 2% disc. 15 days. •c Less 10¢ disc. 10 days. •d 10¢ disc. 20 days. •e Truckload lots. •f Fob mill, add $14.58 to $21.31 per car switching charges. •g fob mill + freight. •h LCL. •i Less 2% disc. 10 days. •j Truck lots, fob yard. •k 100 bag lots. •l over 150 sacks. •m Sold in bags only. •n Less 5% disc. 30 days. •o Plus 50¢ for Sat. del. •p 5-8 ton truckload. •q F.o.b. mill •r 50 cy & over •s In bags & bbl. Only. •t min. 7 tons

SAND, GRAVEL, STONE & SLAG: •a Truck lots. •b Per cu. yd. •c 5 tons up. •d Less 5¢ disc. 10 days. •e Less 2% disc. 10th. •f Less 2% disc. 15th. •g Less 5% for cash. •h Less than 5 tons. •j F.o.b. quarry. •k Barge lots asd. •l F.o.b. scow Hudson river. •m Less 2% for cash. •n F.o.b. cars. •o F.o.b. yard. •r less 5% disc. 15th. •s Less 2% disc. 10 days. •t Less 10¢ disc. 10 days. •u Less 5¢ disc. 10 days. •v Less 2% disc. 15 days. •w Less 10¢ disc. 15 days. •x Incl. 35¢ switch charge. •y F.o.b. dock. •z 5-8 tons. •aa Less 5% disc. 15 days. •bb Less 2% 25th of month

CONCRETE BLOCK: •a Cinder. •b Waylite. •c Haydite. •d Celocrete. •e 5¼ x 8 x 12 in. •f 8 x 4 x 16 •g F.o.b. truck at job. •l F.o.b. plant San Rafael. •m F.o.b. yard. •n 8 x 8 x 18. •o Less 2% disc. 10 days. •p Less 2% disc. 10th, •q Less 5% disc. 10th. •r Less 2% disc. 15 days. •s Less 2% disc. cash. •t Siporex, 7 x 8 x 18. •u Less 5% disc. 10 days. •v Less 12% disc. 15th.

READY MIXED CONCRETE: •a 6 cu yd or over del. Man. •b 25 cu yds or more. •c 10-100 cy. •d 1-3 mi. zone add 15¢ for ea. add'l 1-mi. zone. •e 3,000 lb comp. •f 2,500 lb. comp., less 5% disc. 30 days. •g Less 25¢ disc. 15 days. •h Less 50¢ for cash. •i 5% off for cash. •j 2% off for cash. •k Federal tax included. Add 6% mun. & prov. tax. •l 1:2½:3½ base price. •m F.o.b. yard. •n Plus escalator clause. •o Less 2% disc. 15 days. •p Less 50¢ disc. 15 days. •q Less 2% disc. 10 days. Add 50¢ per zone. •r 2000 wgt. •s Less 5% disc. 10 days. •t Incl. 50¢ heating. •u Less 2% disc. 15th. •v Sat. del.+50¢. •w 10-100 cy. •x Del in zone 20-B. •y less 25¢, 10 days. •z less 1% in 30 days. •aa 6 bag mix

MILL PRICES FOR BULK CEMENT: Subject to 10¢ discount, 15 days. For paper bags add 50¢ per bbl., not refundable. *Prices guaranteed through December 31, 1961*

Richard City, Tenn	$3.55	Bath, Pa	$3.50	Northampton, Pa	$3.50	Leeds, Ala	$3.40	Howes Cave, N. Y.	$3.50	Oswego, N. Y.	$3.60	Green Bay, Wis	$3.60
Clinchfield, Ga	3.55	Lesley, Pa	3.50	Universal, Pa	3.60	Duluth, Minn	3.60	Muskegon, Mich	3.55	Cleveland, O	3.65	Ironton, O	3.65
Kingsport, Tenn	3.55	Buffington, Ind	3.55	Waco, Tex. (+ 10 tax)	3.35	Hudson, N. Y.	3.50	Saginaw, Mich	3.60	Alsen, N. Y.	3.50	Montreal, Canada (a)	2.80
West Des Moines, Iowa	3.65	Independence, Kan	3.35	Giant, S. C.	3.55	Alpena, Mich	3.50	Wyandotte, Mich	3.60	Toledo, O	3.60	W. Winfield, Pa	3.60
Nazareth, Pa	3.50	Hannibal, Mo	3.55	Steelton, Minn	3.60	Detroit, Mich	3.60	Buffalo, N. Y.	3.55	Milwaukee, Wis	3.60	Security, Md.	3.50

•a 350 lb. bbl.

PAVING BRICK, BLOCK, ASPHALT, ROAD OILS - F. O. B. CITY

Item	Quantity	Unit	Atlanta	Baltimore	Birmingham	Boston	Chicago	Cincinnati	Cleveland	Dallas	Denver	Detroit	Kansas City	Los Angeles	Minneapolis	New Orleans	New York	Philadelphia	Pittsburgh	St. Louis	San Francisco	Seattle	Montreal	Toronto
Paving brick, block-																								
Brick, 3"x4"x8½"	CL	M	.....e	.....e	.....e	.....e	$150.00#ab	.....e	.....e	.....e	.....e	.....e	.....e	.....e	.....e	.....e	.....e	.....e	$60.00k	.....e	.....e	.....e	.....e	.....e
Granite, 4"x4"x8"	q	M	.....e	.....e	$66.00i	.....e	95.00#a	.....e	89.50	40/80	62.00a	$114.00	.....e	.....e	.....e	.....e	.....e	.....e	95.00n	.....e	$70.00	.....e	.....e	$120.00f#
Wood, 3½" 16 lb.	...	sy	.....e	.....e	.....e	.....e	3.95/4.00aj	.....e	6.30	.....e	.....e	.....e	.....e	.....e	$3.73	e	$3.70f	.....e	6.35n	.....e	.....e	.....e	.....e	4.50f
Asphalt, paving																								
Tank car	CL	ton	$0.1182W	$21.00	25.12 O	$22.00apS	22.00b	$26.00SU	26.00tA	26.90	.....	31.00#	$18.75cl	$18.00dmx	23.70	$20.00e	22.90mO	0.21u	31.20isv	$19.74	22.50gdd	$24.00z	$30.50n	38.90
Drummed	CL	gal.	0.1220W	.....	25.69	46.00apS	32.00b	.....	.....	46.35	.....	.....	.....	.....	.....	.....	67.83mO	.....	.....	21.65	41.00gdd	47.00h	43.60n	59.01ee
Asph. binders, fluxes																								
Tank car	CL	ton	0.1182W	0.9i	0.1069	22.00avS	20.40bv	26.00ffv	26.00tvA	.1138	.....	31.00#	18.75cv	18.00dvx	23.70	20.00ev	22.90vtO	0.21u	31.20isv	.1825f	22.50gkvdd	33.00vscc	0.167n	0.2135ee
Drummed	CL	gal.	0.1220W	0.18i	0.1093	46.00avS	30.40bv	.....	.....	.1983	.....	.....	.....	.....	.....	.....	67.83vtO	.....	.....	.1825	40.00gkvdd	38.50	0.211n	0.2367w
Asph. cutback, MC																								
Tank car	CL	ton	0.1222W	0.9i	0.1163w	0.105awF	.10bwH	0.1165twAF	0.1165wSU	30.50	.....	30.24wl#	.0825cwJ	19.50dKx	0.105w	0.095ew	10.16uF	0.10U	0.1403#S	.09f	22.50gNdd	25.50KE	17.80nuE	0.18wee
Drummed	CL	gal	0.1258W	0.18wE	0.1188Ow	0.22awF	.18bwH	.....	.....	52.45	.....	.....	.....	.....	.....	.....	29.62uF	.....	.....	.092fw	46.50gNdd	.....	22.20nuE	0.235
Road oil, tank car	CL	gal	.....	0.95i	0.1006O	0.14aOR	.08b	0.109	.....	.1100	.....	27.84v	.06751c	18.50dvaa	0.95	0.085eB	.....	0.095U	0.14#S	.165f	23.25gvWdd	28.75hvY	0.155n	0.191w
Asph. emul. RSI																								
Tank car	CL	ton	0.1288W	0.10i	0.1069	0.15OR	.....	0.1265	0.1265tA	0.1138	.....	.10	21.40jXv	0.137bb	0.095eBL	10.15u	.....	0.1403i	.18250	23.50gvXdd	25.80hvX	0.242n	0.204Zee
Drummed	CL	gal	0.1327W	0.19i	0.1093O	.....	.....	.....	0.21A	0.1983	.....	0.29	.....	.1842jXv	.....	0.1905eB	29.81u	.....	.....	.30	.2023gXdd	49.80hvX	0.27nX	.26Zee

PAVING BRICK & BLOCK: •a Less 2% disc. 10th. •b 3 x 3¼ x 8. •c 2¼ x 8 x 4. •d Truckload lots. •e Not used. •f 2" interior 6 lb tr. •g Less $1/Mdisc. 15th. •h 2" tr. 8 lb. •i 3 x 3½ x 8½. •j 2½", 6 lb. tr. •k Used. •l Redshale. •m Pine; oak $6.57. •n Truck del. •o Less $1 M disc. 15 days. •p Used: $40; new: $80. •q Lots of 50M.

ASPHALTS: •a F.o.b. refinery, Everett, Mass. •b F.o.b. refinery, Lockport, Ill. •c F.o.b. Sugar Creek, Mo. •d F.o.b. refinery, El Segundo. •e F.o.b. Baton Rouge. •f F.o.b. Hartford, Ill. •g F.o.b. refinery, Richmond, Calif. •h F.o.b. Martinez. •i F.o.b. refinery, Baltimore. •j F.o.b. refinery, Inglewood, Calif. •k 50-110 penetr. •l Less than 100 penetr. •m 40/300 penetr. •n F.o.b. refinery, Montreal. Fed. tax included; add 6% for mun. & prov. •o Drums not avail. Shipped in steel bbl. •p 60/70 penetr. •r In customer's drums. •s Shipped in drums, per drum. •t 150/300 penetr. •u Per 100 gal. •v Per ton. •w Per gal. •x Also tank trucks •y F.o.b. Oakland. •z F.o.b. Edmonds. •A F.o.b. refinery, Cleveland. •B F.o.b. Destrehan, La. •E RC. •F Also RC. •G Also MS •H RC 0-5 incl. •I MC 4. •J MC, RC $0.095. •K MC 3, 4, & 5. •L MS. •M MC 1-5, RC 1-5, $0.0918. •N MC 3. •O Truckload. •P F.o.b. refinery, Atlanta. •Q F.o.b. Eldorado, Ark. •R Delivered within 50 mi. •S Less 2% disc. 10 days, net 30. •T Less 1% disc. 10 days. •U F.o.b. refinery. •V Less 2% disc. 15 days. •W SC 2. •X RS 1. •Y SC 1. •Z Incl. 10% Sales Tax. •aa SC 3, 4, & 5. •bb RS 3. •cc In used drums. •dd less disc of $1 ton. •ee 45 Imp. gal. drums •ff 60-150 penetration

Labor and Materials Prices

Monthly Market Quotations by ENR Field Reporters

See following ENR issues for OTHER PRICES.

- Wood Products, Glass, Exposives, Chemicals: Last, June 22: Next, July 20.
- Iron & Steel Products, Pipe: Last, June 15: Next, July 13.
- Clay Products, Lime, Plaster, Paint, Roofing: Last, June 29: Next, July 27.

HOURLY WAGE RATES—Base rate + fringe benefits

Classification	Atlanta $ + ¢	Baltimore $ + ¢	Birmingham $ + ¢	Boston $ + ¢	Chicago $ + ¢	Cincinnati $ + ¢	Cleveland $ + ¢	Dallas $ + ¢	Denver $ + ¢	Detroit $ + ¢	Kansas City $ + ¢	Los Angeles $ + ¢	Minneapolis $ + ¢	New Orleans $ + ¢	New York $ + ¢	Philadelphia $ + ¢	Pittsburgh $ + ¢	St. Louis $ + ¢	San Francisco $ + ¢	Seattle $ + ¢	Montrea $ + ¢	Toronto $ + ¢
COMMON LABOR																						
Building	2.00	2.30+7½	1.95	2.75+10	3.225+7½	2.90	3.52	1.85	2.47	3.00+34	2.705	3.26+10	3.00	1.925	3.65+292	2.70+15	2.725+20	3.025+10	3.225+10	3.00+25	1.75+4	2.00+8
Heavy Const.	2.00	2.30+7½	2.05	2.75+10	3.225+7½	3.025	3.435	1.85	2.42	3.00+34	2.755	3.26+10	2.98	2.00	3.65+292	2.65+10	2.55+20	3.025+10	3.225+10	3.00+25	1.75+4	2.00+8
SKILLED BUILDING TRADES																						
Bricklayers	4.00	4.10+15	4.05	4.20+30	4.40+10	4.125+14	4.085+25	4.15	4.15	4.09+33	4.20	4.35+25	4.175	3.775+7½	5.20+62	4.40+17	4.50+20	4.25+33	4.40+42½	4.15+30	2.55+6	3.20+13
Carpenters	3.35	3.60+7½	3.23	3.85+10	4.08+20	3.95	4.26	3.50	3.65	3.75+46	3.75	4.00+20	3.83	3.35	4.75+38	4.00+20	4.125+20	3.975+104	3.875+36	3.53+20	2.35+5	2.95+12
Struct. Iron Workers	3.70+7½	4.10+20	3.72+10	4.14+20	4.55+16	3.95+10	4.16+10	3.675+8	3.81+10	4.10+27½	3.90	4.275+25½	3.92+15	3.65+10	5.05+706	4.45+23	4.30+20	3.975+104	4.275+25	3.92+10	2.55+6	3.05+12
Plasterers	3.50+3	3.85+10	3.37	3.80+45	4.17+27	3.925+1	4.16	3.875+10	3.975+15	3.87+41	4.00	4.25+55	3.77+33	3.34+5	4.95+67	4.15+20A	4.225+20	4.00+7½	3.79+63	3.87+32	2.65+6	3.20+21
Electrical Workers	4.00+5	3.85+10	3.65	4.10+25	4.30	4.09+51	4.29	3.625+7½	4.20	4.11+52	3.90+43	4.65+46	3.85+44	4.00+7½	4.40+26	4.525+18	4.60+34½	4.11+51	4.38+46	3.95+27	2.55+5	3.60+19
Steamfitters	4.00+25	3.96+18	3.80+12	3.95+27	4.25+25	4.10+215	4.06+20	3.70+8½	4.05+12	3.90+51	3.85C+245	4.33+64	3.62+37	3.90+7½	4.80+772	4.35+32	4.20+20	4.425+25½	4.36+72	4.14+29	2.62+6	3.47+13
EQUIPMENT OPERATORS																						
Hoisting Engineers	3.675	4.10+20	3.30	4.05+20	4.05+05	3.90A	4.26	3.65	3.25	3.74+39½	3.72	4.01+25	3.75	3.475+7½	4.90+39	4.345/4.205 +275A	3.73+20	4.175	3.80+35	3.94+20	2.35+5C	3.25+13
Tractor Operators (B)																						
34-49 hp	3.15	3.70+20	3.30	3.575+35	3.80+5	3.675+10	4.01	2.625	2.50	3.74+39½	3.025	4.31+25	3.36	3.475+7½	4.375+35	3.78 +275	3.72+20	4.175	4.01+35	3.91+20	1.95+4C	2.50+10
70-100 hp	3.15	3.70+20	3.30	3.575+35	3.95+5	3.675+10	4.01	2.625	3.10	3.74+39½	3.475	4.31+25	3.60	3.475+7½	4.375+35	3.925+275	3.72+20	4.175	4.01+35	3.91+20	2.18+5	2.60+10
Over 100 hp	3.15	3.70+20	3.30	3.575+35	3.85+5	3.675+10	4.01	2.625	3.10	3.74+39½	3.475	4.31+25	.....	3.475+7½	4.375+35	3.925+275	3.72+20	4.175	4.01+35	3.91+20	2.18+5	2.60+10
Tractor Scraper, 15-16 cy	3.15	3.70+20	3.30	3.575+35	3.85+25	3.675+10	4.01	2.625	3.10	3.74+39½	3.475	4.31+25	3.60	3.475+7½	4.50+36	4.05+10	3.72+20C	4.175	4.14+35	3.91+20	2.18+5C	2.60+10
Power cranes & shovels																						
½ cy	3.675	4.10+20	3.30	4.00+35	4.40+5	3.675+10	4.26	3.375	3.25	3.74+39½	3.72	4.31+25	3.82	3.475+7½	5.25+420	4.495+275	3.92+20	4.175	4.31+35	4.28+20	2.45+5	3.10+12
¾ cy	3.675	4.10+20	3.30	4.00+35	4.40+5	3.90+10	4.26	3.375	3.25	3.74+39½	3.72	4.31+25	4.08	3.475+7½	5.25+420	4.495+275	3.92+20	4.175	4.31+35	4.28+20	2.45+5C	3.25+12
Motor grader operator	3.15	3.25+20	3.30	4.00+35	3.85+5	3.90+10	4.01	2.625	3.10	3.74+39½	3.72	4.31+25	3.36	3.475+7½	4.50	4.025+275	3.92+20	4.175	4.21+35	4.00+20	2.18+5C	2.90+11
Air Comp. operator	2.825	3.30+20	2.89	3.55+35	3.70+5	3.90+10	3.885	2.00	3.10	3.74+39½	3.475	3.53+25	3.25	2.75+7½	4.50+35	3.66+275	3.43+20	3.625	3.48+35	3.64+20	2.05+5	2.60+10
Air tool operator	2.22	2.325+7½C	2.15	2.80+10	4.00+5	3.90+10	3.885	2.00	2.75	3.13+34	2.80	3.47+10	3.30	2.075	4.10+492	2.55+10	2.60+20	3.625	3.655+10	3.35+10	2.05+5	2.60+10
TRUCK DRIVERS																						
1½ Ton	2.10	2.27+075	2.00	2.85+23	2.68+21	2.70+62½	3.07+15	2.625	2.70	3.11+18	2.68	3.525+10	2.98	3.475+7½	3.275+28	2.64+18	2.59+20C	3.03+15	3.79+11	3.50+20	1.75+4	2.05+15
Under 4 cy	2.20	2.27+075	2.20	2.85+23	2.68+21	2.75+6½	3.07+15	2.625	2.85	3.11+18	2.68	3.525+10	2.98	3.475+7½	3.275+28	2.64+18	2.635+30	3.23+15	3.27+11	3.50+20	1.75+4	2.05+15
Over 4 cy	2.50	2.27+075	2.45	2.85+23	2.68+21	2.80+6½	3.07+15	2.625	3.05	3.11+18	2.755	3.765+10	3.13	3.475+7½	3.275+28	2.64+18	2.735+20	3.33+15	3.08+11	3.70+20	1.75+4	2.05+15

ENR Skilled Labor Average (Bricklayers, Carpenters, Iron Workers): $4.178, ENR Common Labor Average $2.826 Description of fringe benefits last appeared Sept. 22 ,1960. *A 2 drum. *B Including Bulldozers *C correction

BUILDING BOARD & LATH AND INSULATION—DELIVERED TRUCKLOAD LOTS

	Atlanta	Baltimore	Birmingham	Boston	Chicago	Cincinnati	Cleveland	Dallas	Denver	Detroit	Kansas City	Los Angeles Q	Minneapolis F	New Orleans	New York	Philadelphia H	Pittsburgh	St. Louis HO	San Francisco	Seattle	Montreal	Toronto
GYPSUM BOARD & LATH																						
Plaster board, ½"	$62.50F	$54.00	$63.00H	$60.00mH	$67.50	$53.50wH	$63.00CF	$57.50	$64.50H	$66.00K	$72.00H	$67.00F	$68.00	$57.00H	$70.00H	$54.00	$74.00K	$56.50/67.50	$60.00	$71.75K	$58.00M	$49.50
" " ⅝"	52.50F	47.50	52.00H	50.00mH	54.50	43.85wH	56.50CF	47.50	54.00H	56.00K	62.00H	60.50F	58.00	52.00H	55.00H	45.00	65.00K	51-56HO	49.00F	59.50K	50.00M	37.25
Board lath, ⅜"	40.00F	35.75	47.77H	35.00mH	45.00	33.05wH	39.00CF	43.50	42.00H	42.45K	45.00H	0.33xF	0.41xL	45.00H	42.50H	36.50	40.00K	40.00HO	0.36xF	51.50K	39/42.00M	41.00L
SHEATHING																						
Gypsum T & G, ½"	62.50F	55.70	75.00H	55.00mH	62.50	51.16wH	58.75CF	57.50	66.75H	66.00K	.....	64.50F	67.00	60.00H	60.00H	52.50	63.00K	67.00HO	61.00F	70.00K	54.00M	70.00
Fiber board, ½", sq. e	72.00F	65.00	67.50H	65.00H	87.00	77.00wH	72.50CF	68.75	62.50H	48.50DK	75.00H	75.00F	100.00	67.00H	78.00	65.00	60.00K	65-75HO	70.00F	68.50K	63.00M	71.50T
" " 25/32", T & G	.....	108.50	140.50H	120.00H	123.00	125.00wH	115.00CF	118.00	107.50H	85.65DK	122.00H	125.00F	135.00	140.00H	124.00	115.00	100.00K	115/120	111.00F	68.50K	.....	.....
INSULATION																						
Fiber board, sq. e., ½"	75.00F	69.00	83.50H	79.00hnH	87.00	72.50wH	80.00CF	68.75	77.00	62.50DK	80.00H	80.00F	81.00	80.00H	78.00	65.00	60.00K	75/80	69.00F	71.00K	73.00M	79.50T
Min. wool, loose	1.59z	1.40F	1.40	1.70bH	1.85	1.45wH	1.35	2.00	1.55b	1.30b	1.40H	76.00BeF	1.75y	3.00L	1.55b	1.20	1.25sK	125/135	1.75F	1.25tK	1.35M	1.85
" " 3" batts	67.80F	67.50	70.00	75.00H	80.00	60.00wH	70H	70.00	65.00ub	52.00	75.00H	83.00F	70.00	70.00*	68.50k	50.00	55.00K	60/70	66.50F	58.00K	60.00M	57.50
Glass fiber, loose	1.45	1.60F	2.00	.....	.....	1.45wH	.....	1.75	2.00b	1.85b	1.80H	1.35s	1.75	.....	.....	1.40	1.25sk	2.00P	1.75F	1.90*pK	1.35M	.....
" " 3" batts	50.00F	47.00F	65.00	75.00H	63/65	60.00wH	61.00	70.67	65.00a	80.00	75.00H	64.00	70.00	.....	68.50	50.00	55.00K	68.50	66.50F	51.00*lKh	60.00M	57.50
Aluminum foil, 1 side	3.75qi	4.00F	3.77gG	5.30xHS	5.25	3.02jwJ	14.00toJ	5.00gAG	5.25	.....	3.60d	4.40g	3.50	6.50	4.38iH	2.90	4.25igK	4.39ig	5.10	7.47K	9.00qM	15.50o
" " 2 layers	.....	33.50F	.....	53.50qH		66.00wJ	55.00J	45.00	48.65	.....	60.00	7.45V	.....	.....	40.00cH	83.50	38.50K	.....	60.00F	39.53EK	56.00M	46.00

*• F.o.b. warehouse. *a Semi thick. *b 30# bag. *c 3 layers of foil: $54.50. *d 40# kraft paper, 5 Msf, 100/500 rolls. *e 20# sq ft bag, 4" thick. *f Full trailer loads. *g 80# kraft paper backing 400 rolls or over. *h LCL. *i 40#. *j 80#. *k 2-in. *l 2". *m 8 to 10 ton quantities. *n Distributor's siding. *o Per Msf roll. *p 32# bag. *q 500 sf. *s 35# bag. *t 26# bag. *u Flame proof $75. *v 5000 sf quantity. *w F.o.b. city. *x Sq. yd. *y 30# bag. *z Spun rock wool. *A 650 sf. *B ton *C F.o.b. plant, freight allowed. *D CL. *E 10 Msf. *F Less 2% disc, 10th. *G ½ of 1% 10 days. *H 2% disc, 10 days. *J 1% disc, 10 days. *K Less 2% for cash. *L 5% disc, 10th mo. *M fed. tax incl. *N 1% disc, 10 days. *O add 2% sales tax. *P 50 lb. bags. *Q add 4% sales tax *R revised. *S 45 lb. *T less 2% 30 days. *U lots of 2606 sq. ft. *V 250 sf roll.

MEXICO CITY WAGES AND PRICES, JUNE, 1961

WAGES, av per week, 8 hr day (pesos) 6 days work-extra day's pay

Common labor,	building (peons)	101.50
	heavy const (peons)	136.50
Skilled labor;	carpenters 1 cl	210.00
	bricklayers 1 cl	245.00
	struct, ironworkers	315.00

MATERIAL PRICES, F.o.b. City (pesos)

Struct. steel shapes, fob Monterrey		
I-beams, 3 x 3 x 4"	per metric ton	1942.10
Reinf. steel, corrugated rods, per ton		
⅜"-½" x 11 meters consolidada		1875-1950
¾"-1" x 11 meters		1750.00
Gravel, truckload, per cu meter		
Blue gravel		30.00
Cement, std. port. (Tolteca)	per metric ton	260.00
Lumber, 2" x 4" 1st class pine 20 ft.	per M sq. ft.	3000.00
2" x 4" 2nd class pine	per M sq. ft.	2300.00

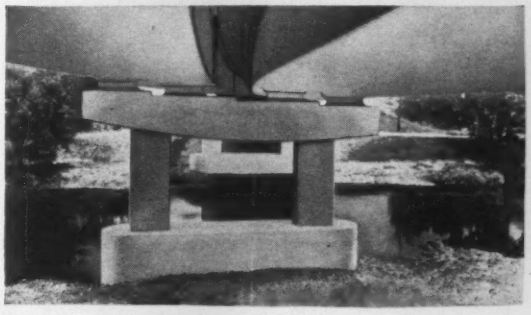
there must be a reason for this
REINFORCED CONCRETE preference

Box Girder Bridge over Kenduskeag Stream
Interstate Route 95, Bangor, Maine
Designers: The Clarkeson Engineering Company, Boston,
Consulting Engineers for Maine State Highway Commission
Contractor: Westcott Construction Company, North Attleboro, Maine

Of 14,703 bridges authorized for federal aid during the years 1957, 1958, and 1959, 2 out of 3 were reinforced concrete construction . . .

9,639 were reinforced concrete
3,696 were structural steel
1,368 were prestressed concrete

There must be a reason for reinforced concrete's preference! On your next project investigate this more versatile, low cost construction material.



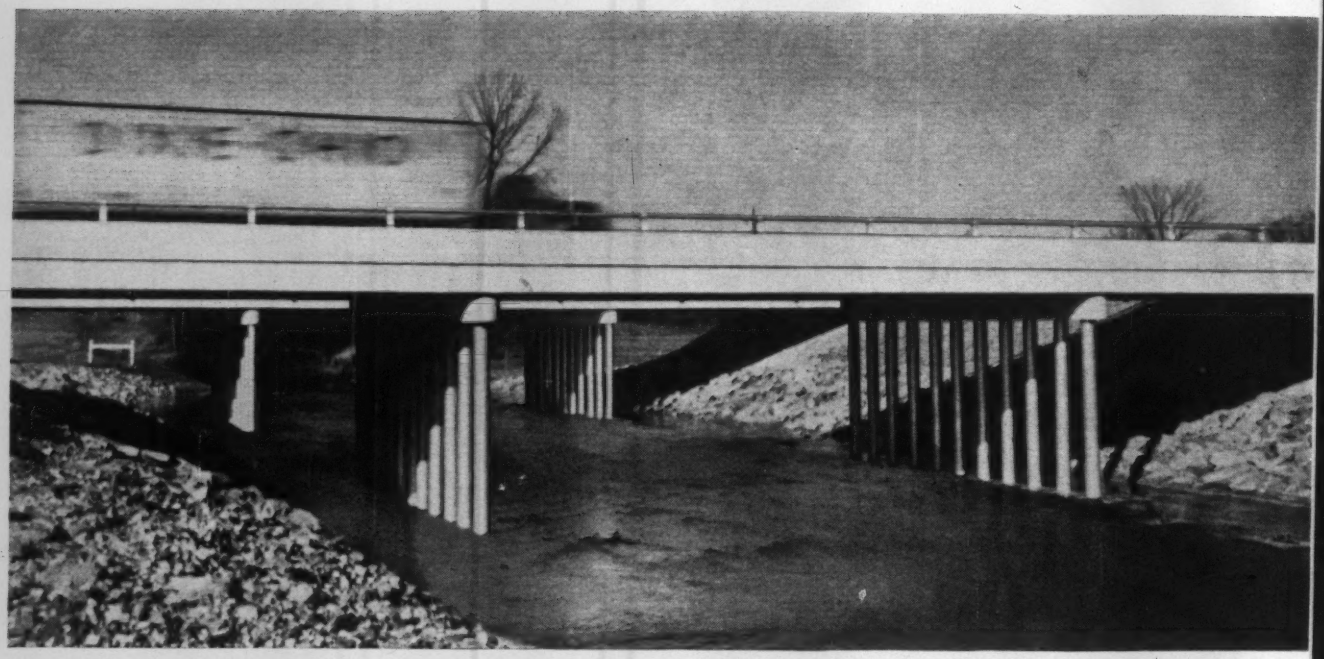
Concrete Reinforcing Steel Institute
38 South Dearborn Street
Chicago 3, Illinois

2-61

Steel

For strength, durability, economy

Why Armco Pipe Piling



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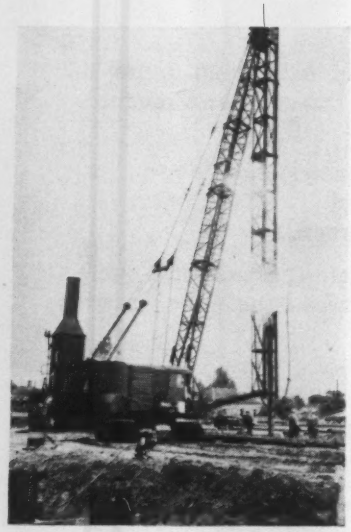
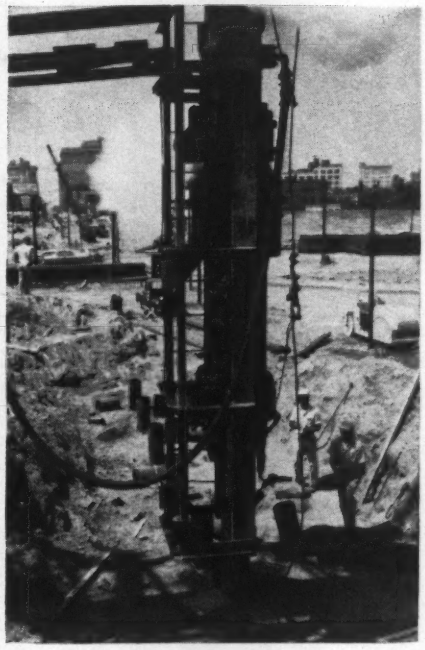


4.

1. Twin bridges on exposed Armco Pile bents carry Interstate 71 over Clear Fork Creek in Ohio.
2. Armco Piling is driven for foundation of bridge abutment on Cleveland Innerbelt — part of Interstate 90 in Ohio.
3. Here are 60-foot lengths of Armco Piling at site of foundation for approach work of new Woodrow Wilson Bridge at Alexandria, Virginia. Interstate 495.
4. Interstate 10 construction at Lake Charles, Louisiana, features foundation of Armco HEL-COR® Pile Shells.
5. Bridge abutment on Interstate 5W in California will rest on Armco Pipe Piling foundation. Note batter piles.

and Pile Shell Get the Important Jobs **on the Interstate System**



2.

Interstate Highway construction, with its controlled access requirements, puts the spotlight on bridges. To handle the tremendous job of foundations for the hundreds of bridge piers and abutments, highway builders are relying more and more on the Armco family of foundation products. Why? *They have been proved in service.* Engineers and contractors know what they will do from past performance.

Armco Pile Shell is a lightweight, helically corrugated shell. It is supplied in specified lengths—*any* lengths up to 64 feet. It is well known for its uniform roundness that makes splicing easy. Salvage of short cut-offs is practical.

Armco Steel Pipe Piling is available in specified lengths up to 90 feet. By specifying lengths, you reduce field splicing to a minimum. Handling is simplified, driving goes fast. Armco Piling is made to ASTM Specification A 252-59, and it is delivered with a mill certificate to prove it. This mill certificate assures the exclusion of sub-standard pipe from your projects.

You can get Armco Pile Shell in 16 different diameter-wall thickness combinations; Pipe Piling in 132 diameter-wall thickness combinations. Thus you can specify *exactly* the foundation pipe you need, without compromise.

Use the coupon to send for a 16-page catalog on Armco Foundation Products. It provides the specifications and dimensional data you need. In addition, an authoritative, 105-page book, "Pipe Piling for Bridges and Buildings" is available through the Armco Sales Engineer in your area. Check the coupon to reserve your free copy. **Armco Drainage & Metal Products, Inc., Subsidiary of Armco Steel Corporation 6921 Curtis Street, Middletown, Ohio.**

5.

New steels are born at Armco

Armco Drainage & Metal Products, Inc.,
6921 Curtis Street, Middletown, Ohio

☐ Send me the 16-page catalog on Armco Foundation Products.

☐ Ask Armco Sales Engineer to bring me comprehensive, 105-page book, "Pipe Piling for Bridges and Buildings."

NAME ..... TITLE .....

FIRM .....

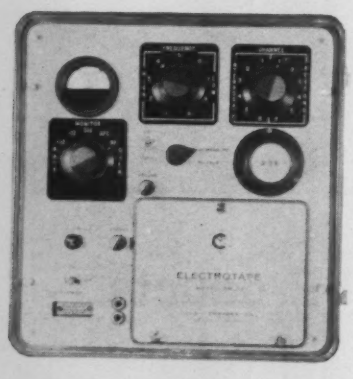
STREET .....

CITY ..... ZONE ..... STATE .....

TELEPHONE NUMBER .....

ARMCO **Drainage & Metal Products**

Cubic DM-20 Electrotape system quickly pinpoints location of off-shore installation.



ELECTROTAPE WORKS WHERE CHAIN AND TAPE WON'T: The new, lightweight, all-transistorized version of Cubic Electrotape, Model DM-20, marks a major breakthrough in the art of surveying. Electrotape eliminates time-consuming chain and tape work, and lets even unskilled operators measure distances from 150 feet to 40 miles in just a few minutes per set-up. Easily operable by one man, the DM-20 weighs only 25 pounds. Its accuracy is 1 centimeter plus 3 parts per million, and the front panel readout is directly in centimeters, eliminating scope or meter interpretations. The DM-20 operates day and night, in any weather, with a built-in radio-telephone permitting communication between operators at all times. A single tripod-mounted unit incorporates the recessed parabolic antenna, regulated power supply, compact battery, and electronic circuits. Write for descriptive literature to Dept. ENR-104, Industrial Division, Cubic Corporation, San Diego 11, California.

cubic CORPORATION

INDUSTRIAL DIVISION

SAN DIEGO 11, CALIFORNIA

Bid Asked—Low Bidders—Contracts Awarded—

NEW ENGLAND

HEAVY CONSTRUCTION—BA

▲ **R. I., Middletown**—BA 7/10—Town, Town Hall, SEWAGE TREATMENT PLANT and two pump stations, Coddington Hy., $1,323,000. Plans deposit $50. Charles A. Maguire & Assoc., Turks Head Bldg., Providence, engrs. CD 12/18/59.

† **Mass., Bedford**—BA 7/13—U. S. Eng., 424 Trapelo Rd., Waltham 54, Mass., PLASMA PHYSICS LABORATORY (FY-61), Laurence G. Hanscom Field, ENG-19-016-61-81. $750,000. Hoyle, Doran & Berry, 248 Boylston St., Boston, Mass., archts. CD 5/25/61.

BUILDINGS—BA

▲ **Conn., Bridgeport**—BA 7/13—University of Bridgeport, 219 Park Ave., Proj. No. CH-CONN-15(DS) two 4 story, rein.-con. framed DORMITORIES, FOOD SERVICE BLDG. ADDN. $1,900,000. Plans deposit $100. Extended date. CD 5/31/61.

▲ **Mass., Franklin**—BA 7/18—Town, High School, West Central St., HIGH SCHOOL, Oak St. $1,500,000. Plans deposit $60. J. Williams Beal Sons; Granger & Dyer, 185 Devonshire St., Boston, Mass., archts. A. Ehrenzeller, Inc., 329 Washington St., Dorchester, Mass., mech. engr. CD 6/2/61.

▲† **Chaney & James Constr. Co.**, P. O. Box 1363, Dallas, Tex., CA $2,028,359, est. $2,000,000, AIR ROUTE TRAFFIC CONTROL CENTER, IFB No. 1-61-144B1, NASHUA, N. H. Federal Aviation Agency, Fed'l. Bldg., New York International Airport, Jamaica, N. Y. BA 5/15/61. Former contract cancelled. CD 6/2/61 under CA.

BUILDINGS—LB & CA

▲† **Chaney & James Constr. Co. Inc.**, 5647 Milton St., Dallas, Tex., CA $1,935,480 Sched. 2, REACTOR LABORATORY, Bldg. 292 and SURFACE TREATMENT FACILITY, Bldg. No. 44, Watertown Arsenal, WATERTOWN, MASS. U. S. Eng., 24 Trapelo Rd., Waltham, Mass. BA 6/1. CD 6/14/61 under LB.

▲ **Cherry Hill Shopping Center, Inc.**, Cherry Hill, Branford, Conn., Owner Builds, $2,800,000, Cherry Hill SHOPPING CENTER, ADDN., off Rte. 1, near Connecticut Tpk. BRANFORD, CONN. H. I. Fieldman, 415 Lexington Ave., New York, N. Y. archt. CD 6/15/61.

▲ **John A. Bozzuto & Sons**, 560 Hill St., Hamden, Conn. Owner Builds, $2,655,000. 150 HOUSES, White Hollow Estates, White Hollow Road, NORTHFORD, Conn.

▲ **Associated Builders' Corp.**, c/o Austin K. Wolf, Atty., 955 Main St., Bridgeport, Conn., CA $3,000,000. 100 HOUSES, Orange Country Hills, Wilbur Cross Parkway Area, ORANGE, CONN. Adolph Bialek, 17 Punch Bowl Drive, Westport, Conn. CA 6/22/61.

▲ **P. Francini Co. Inc.**, Water St., Derby, Conn., CA $1,239,000, Eastside JUNIOR HIGH SCHOOL, Pond Hill Road, WALLINGFORD, CONN. Town, 1958 Bldg. Comm., N. Main St., Wallingford, Conn. BA 6/8/61. CA 6/22/61. CD 6/12/61 under LB.

▲ **J. L. Marshall & Sons, Inc.**, 560 York Ave., Pawtucket, R. I., CA $1,500,000, Mother of Hope NOVITIATE, West Main Rd., PORTSMOUTH, R. I. Sisters of Our Lady of Providence, c/o Most Rev. Russell J. McVinney, DD., Bishop of Providence, 34 Fenner St., Portsmouth, R. I. BA 6/2/61. CD 5/17/61.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

D. C., Wash.—BA 7/26—D. C. Govt. Dpt. Hys., 499 Pennsylvania Ave., NW, river crossing superstructure for Theodore Roosevelt Bridge. Plans deposit $50. Modjeski & Masters, Foster & 6th, Harrisburg, Pa. engrs. CD 9/5/58.

BUILDINGS—BA

▲ **N. Y., New York**—BA 7/26—Catholic Center at New York University, 2 Washington Sq. N., New York, N. Y., 4 story Catholic STUDENT CENTER, Washington Sq. Campus. $1,225,000. Eggers & Higgins, 100 E. 42 St., New York, N. Y., archts. Frank J. Sullivan, 41 E. 42 St., New York 17, N. Y., mech. engr. Matthew Hiller, 207 E. 32 St., New York 16, N. Y., struct. engr. CD 6/17/60.

▲ **N. J., Paterson**—BA 8/3—Bd. Educ. City of Paterson, 137 Ellison St., ELEMENTARY SCHOOL, second Ward. $2,200,000. Edward W. Fanning, 49 Ward St., Paterson, N. J., archt. CD 5/16/60.

▲† **D. C., Wash.**—BA 8/15—General Services Admin., Regional Office Bldg., Room 7122, 7th & D Sts., EMPLOYMENT SECURITY BLDG., Dpt. Labor, Plans deposit $100. adv ENR 7/6/61. CD 7/14/59.

HEAVY CONSTRUCTION—LB & CA

▲ **Rand Constr. Co., Inc.**, 386 Park Ave. S., New York 16, N. Y., LB $1,498,600 (6 bidders), Contr. NYA-590.010, CARGO BLDGS. 86 and 87, New York International Airport, IDLEWILD, N. Y. Port of New York Auth., Rm. 1100, 111 Eighth Ave., New York 11, N. Y. BA 6/22. CD 5/26/61.

▲ **William Clemente**, 3405 Ocean Ave., Oceanside, N. Y., LB $1,250,000 (8 bidders), furnishing, del. laying 48 in. WATER MAINS Woodhaven and Cross Bay Blvds., 94 and Redding Sts. and 149 Ave., Queens Boro, NEW YORK. Comr. Water Supply, Gas & Electricity, Rm. 2351, Municipal Bldg., New York 7, N. Y. BA 6/22. CD 6/8/61.

Oakhill Contg. Co., Inc., 41-10 102 St., Corona, N. Y., LB $1,233,000 (8 bidders), alternate, WATER MAINS, Queens Boro (New York).

▲† **American Dredging Co.**, 12 S. 12th St., Phila., Pa., CA $2,962,500, DREDGING Delaware River between Torresdale, Pa., and Riverside, N. J. ENG-36-109-61-48 PENNSYLVANIA and NEW JERSEY. U. S. Eng., 2635 Abbottsford Ave., Phila., Pa. BA 6/6/61. CD 5/4/61.

▲ **Peter Shannon Co.**, 5500 S. Damen Ave., Chicago, Ill., LB $1,849,123 (12 bidders), Unit No. 3, Maryland Tunnel of Potomac INTERCEPTOR SEWER, between Anglers Inn and Great Falls, Md., WASH., D. C. D. C. Govt. Dpt. Sanitary Engineering, 499 Pennsylvania Ave. N.W., Wash., D. C. BA 6/22/61. CD 6/2/61.

BUILDINGS—LB & CA

▲ **Double-M Constr. Corp.**, 1776 Broadway, New York 19, N. Y., LB $1,014,700 (7 bidders) ELEMENTARY SCHOOL west North Middle Neck Rd. and South Sands Point Golf Course, PORT WASHINGTON, N. Y. Bd. Educ., 100 Campus Dr., Port Washington, N. Y. BA 6/22. CD 6/12/61.

▲ **Turner Constr. Co.**, 150 E. 42 St., New York 17, N. Y., CA 30 story BANK ADDN., Wall and New Sts., Broadway, Exchange Pl., NEW YORK, N. Y. Irving Trust Co., 1 Wall St., New York, N. Y. Voorhees, Walker, Smith, Smith & Haines, 101 Park Ave., New York, N. Y., archts. Meyer, Strong & Jones, 230 Park Ave., New York, N. Y., engrs.

▲ **Anthony & John Campagna**, 654 Madison Ave., New York 21, N. Y., Owner Builds est. $5,000,000, 21 story 165,000 sq. ft. FURNITURE MART, OFFICE and SHOWROOM, incl. off-street loading facilities, 215 Lexington Ave. southeast corner 33 St., NEW YORK, N. Y. Resnick & Green, 654 Madison Ave., New York 21, N. Y., archts.

▲ **D. Fortunato, Inc.**, 11 Garfield Ave., Floral Park, N. Y., CA $3,839,000, LIBRARY, PHYSICS BLDG., BIOLOGY BLDG., State University College, Long Island, STONY BROOK, N. Y. State Dpt. P. Wks., State Office Bldg., Albany, N. Y. BA 5/3. Grand total $5,453,600. CD 5/5/61, under LB.

Pansco Elec. Constr. Co., Inc., 820 Elmont Rd., Elmont, N. Y., CA $711,000, ELECTRIC WORK, Library, Physics Bldg., Biology Bldg., State University College on Long Island (Stony Brook, N. Y.). CD 5/11/61, under LB.

H. Sand & Co., Inc., 11 Park Pl., New York 7, N. Y., CA $903,600, HEATING, Library Physics Bldg., Biology Bldg., State University College on Long Island (Stony Brook, N. Y.).

▲ **Tidewater Development Co.**, c/o Stanley Lsigounis, 336 Main St., Ridgefield Park, N. J. Owner Builds. $2,000,000, 5½ story, 63-unit, Y-shaped Caribbean House APARTMENTS off River Road at Orchard Street, EDGEWATER, N. J. Isadore Naftali, 312 High St., Newark, N. J., archt.

▲ **Monroe Koggan**, 27 Marquis Rd., Trenton, N. J. Owner Builds. Over $2,000,000. 113 RESIDENTIAL DEVELOPMENT, Upper Ferry Road, Ewing Twp., TRENTON, N. J.

▲ **Irwin & Leighton Inc.**, 1505 Race St., Phila., Pa., CA $1,000,000, RESEARCH LABORATORY and ADMINISTRATION BLDG., WOODBURY, N. J. Shell Chemical Co., 50 West 50th St., New York, N. Y. Ballinger Co., 1625 Race St., Phila., Pa., archt.

▲ **J. E. Weyman Constr. Co.**, 8309 Old York Rd., Elkins Park, Pa., Owner builds. $1,120,000, 40 RESIDENTIAL DEVELOPMENTS, Loverock, Fawn Drive, ELKINS PARK, PA.

▲ **Facciolo & Barrett, Inc.**, Villanova, Pa., Owner builds. Over $1,000,000, 50 RESIDENTIAL DEVELOPMENTS, Greenlawn, PAOLI, PA.

▲ **Piracci Constr. Co.**, 2552 Woodbrook Ave., Baltimore 5, Md., LB $5,300,000 (6 bidders), Harlem Park JUNIOR HIGH and ELEMENTARY SCHOOL, BALTIMORE, MD. City Bureau Bldg. Constr., 410 Municipal Bldg., Baltimore 2, Md. BA 6/21. CD 6/5/61.

SOUTH

BUILDINGS—BA

▲ **Va., Norfolk**—BA 7/12—College of William and Mary, Hampton Blvd. and Boiling Ave., 2 story, approx. 60,000 sq. ft. masonry, steel BUSINESS ADMINISTRATION and CLASSROOM BLDG. $1,250,000. Plans deposit $50. Oliver & Smith, 333 West Freemason St., Norfolk, Va., archts. CD 9/19/60.

▲ **N. C., Greenville**—BA 7/19—East Carolina College, Greenville, 4 story, 87,670 sq. ft. MEN'S DORMITORY. $1,250,000. Plans deposit $60. Eric G. Flannagan, McCoin Bldg., Greenville, N. C., archt. CD 5/23/61.

▲ **Ky., Lexington**—BA 7/20—Commonwealth Ky., Div. Purchases, Frankfort, 6 story 85 x 160 ft. brick, rein.-con. LIBRARY ADDN., University of Kentucky. $1,700,000. Plans deposit $50. John F. Wilson & Assocs., 508 E. Main St., Lexington, Ky., archts. Porter J. White, 120 W. 2 St., Lexington, Ky., struct. engr. Staggs & Fisher, 508 E. Main St., Lexington, Ky., mech. engrs. CD 11/22/60.

HEAVY CONSTRUCTION—LB & CA

▲ **Virginia**—Bureau Public Roads, Dpt. Commerce, 1554 Columbia Pike, Arlington, ROADS,

J. O. & C. M. Stuart Inc., 3121 South St., N.W., Wash., D. C., CA $1,206,635, grading, drainage, paving and other work for North entrance to airport, 3.1 mi. to Memorial Circle, Alexandria,; George Washington Memorial Parkway, Proj. 1-A-22. BA 6/15/61. CD 6/19/61, under LB.

▲ **Carpenter Constr. Co.**, Bank of Commerce Bldg., Norfolk, Va., CA $1,194,088, Contract 1, general contract, rolled fill DIASCUND DAM, PUMPING STATION and appurtenances for Diascund Water Project, Diascund Dam, NEWPORT NEWS, VA. City, Municipal Bldg., 108 Main St., Newport News, Va. BA 6/14/61. CA 6/20/61. CD 6/20/61, under LB;

Charles F. Smith & Son, Walnut and Birch Sts., Kennett Square, Pa., CA $1,499,165, Contract 5, PRESSURE PIPE Lines, Diascund Dam, (Newport News, Va.).

▲ **ALABAMA**—State Hy. Dpt., Montgomery Zone 4, ROADS,

Southeastern Sand & Gravel Co., Inc., Frank Len Bldg., Montgomery, Ala. CA $2,468,549, base and bit. pave. 15.641 mi. from Opelika NE to Georgia State Line on Inter Rte. 85, Chambers and Lee Counties, BA 5/19/61. CD 5/31/61, under LB.

▲ **Stupp Corp.**, P.O. Box 2548, Baton Rouge, La., CA $1,477,874 Proj. 6012, 194,000 lin. ft. steel pipe PILES for Wharf; CA $602,436 Proj. 6014, 460,000 lin. ft. steel pipe PILES, etc. for Wharf, NEW ORLEANS, LA. Bd. Comrs. Port of New Orleans, Rm. 204, No. 2 Canal St., New Orleans, La. BA 4/14. CD 5/19/61, under LB.

▲ **KENTUCKY**—Commonwealth Ky., Dpt. Hys., Frankfort, ROADS,

Ralph Myers Contr. Corp., Box 230, Salem, Ind., CA $3,522,303 c. conc. pavt. 4.577 mi. East Ky. Turnpike. EK2-2, Powell Co.; CA $4,229,305 c. conc. pavt. 5.826 mi. East Ky. Turnpike. EK-2-4, Wolfe Co. BA 6/9, CA 6/20. CD 6/15/61, under LB.

▲† **J. D. Carter Constr. Co.**, Harrisburg, Ill., CA $1,099,490 CANAL to connect Tennessee and Cumberland Rivers, Grand Rivers, Marshall and Lyon Counties, KENTUCKY. U. S. Eng., 7 Ave. and Broadway, Nashville, Tenn. CA 6/19. CD 5/23/61, under LB.

BUILDINGS—LB & CA

▲ **J. M. Turner & Co. Inc.**, 317 McClanahan St., S.W., Box 1848, Roanoke, Va., CA $1,069,525, DINING HALL, Virginia Polytechnic Institute, BLACKSBURG, VA. Virginia Dpt. Educ., State Office Bldg., Richmond, Va. BA 6/8/61, CA 6/20/61. CD 6/16/61, under LB.

▲ **A. G. Higginsbotham Co.**, Charleston National Bank Bldg. Charleston, W. Va., CA, three precast concrete STAVE SILOS on rein.-conc. superstructure, OFFICE, NITRO, W. VA. Columbia Cement Co. (sub. Pittsburgh Plate Glass Co.,) 632 Fort Duquesne Blvd., Pittsburg, 22, Pa.

▲ **Charles J. Craig Constr. Co.**, 1618 Westminister Drive, Columbia, S. C., CA $1,236,587, HOSPITAL ADDN., alterations, CHARLESTON, S. C., St. Francis Xavier Hospital, Calhoun St., at Ashley Ave., Charleston, S. C. BA 6/15/61. CD 6/20/61 under LB.

▲ **Congaree Constr. Co.**, 3530 Colony Forrest Drive, Columbia, S. C., CA $1,846,000, WOMEN'S DORMITORY COLUMBIA, S. C. University of South Carolina, Sumter St., Columbia, S. C. BA 6/21/61. CD 5/31/61.

▲† **H. L. Coble Constr. Co.**, 1705 Battleground Ave P. O. Box 3328, Greensboro, N. C. LB $7,787,500, 540 unit CAPEHART HOUSING, U. S. Naval Station, NBy-(CH)-37375, Spec. 37375/61. MAYPORT, FLA. Dist. P. Wks., Sixth Naval Dist., Bldg. 13, Charleston, S. C. Joseph H. Bryson, 301-06 Greenleaf Annex, Jacksonville, Fla. archt. BA 6/22/61. CD 5/15/61.

▲ **Heritage Industries, Inc.**, 1048 Kane Concourse, Miami Beach, Fla. Owner Builds, $1,800,000. 200 RESIDENCES and swimming pools, Coral Way and SW 92nd St. MIAMI, FLA. Harvey J. Ehrlich, 19631 NE 18th Court, Miami, Fla. archt.

▲ **Danlee Constr. Co.**, P. O. Box 8466, Jacksonville, Fla. CA est. $1,500,000. MOTOR HOTEL, swimming pool, ST. AUGUSTINE, FLA. Inn Keepers, Inc., P. O. Box 10107, Jacksonville, Fla.

▲ **Demetree Builders, Inc.**, 6915 Beach Blvd., Jacksonville Fla., CA est $1,000,000, SHOPPING CENTER, WINTER PARK, FLA. Aloma Shopping Center, P. O. Box 8218, Jacksonville, Fla.

▲ **McDonough Constr. Co. of Georgia**, 1958 Monroe Dr., NE Atlanta, Ga. CA Est. $2,225,000, 188,000 sq. ft. OFFICE BLDG., CHAMBLEE, GA. Samuel Rothberg & Assocs., 575 Peachtree St., NE Atlanta, Ga. U. S. Internal Revenue Service, lessee. CD 5/29/61, under CA.

▲ **Ralph Kinzalow**, Wellington Drive, Knoxville, Tenn., Owner builds $1,800,000, 47 RESIDENCES, Suburban Hills subdivision, KNOXVILLE, TENN.

▲ **Foster & Creighton Co.**, First American National Bank Bldg., Nashville, Tenn., LB $2,926,000 240 APARTMENT UNITS, NASHVILLE, TENN. Vanderbilt University, 21st. Ave., S., Nashville, Tenn. BA 6/20/61. CD 5/31/61.

PORTABLE CONVEYOR, CAR UNLOADER STOCKPILE AT 210 TPH FOR ICBM BASE CONSTRUCTION

Barber-Greene conveyor system at ready-mix plant increases capacity, virtually eliminates downtime and maintenance costs for contractor

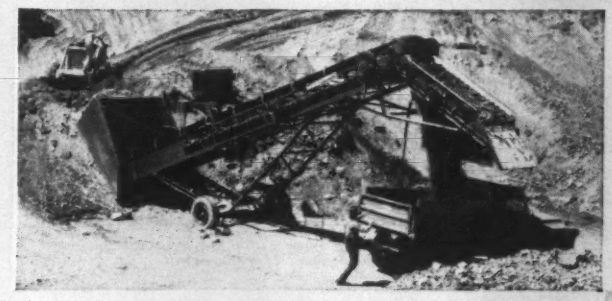
"Our Barber-Greenes have boosted plant capacity, permitted us to buy material in more economical 10-car lots, virtually eliminated downtime and maintenance costs, and helped us to meet tough specs during work on an ICBM base contract," reports Jim Olsen, superintendent of Cass Concrete Products Co.

Sand and gravel for this 16,000 cu. yd. project are brought by rail to the ready-mix plant, located about mid-way between Omaha and Lincoln, Nebr. The big 70-ton hopper cars are unloaded by a Barber-Greene Model 358 Unloader in about 40 minutes each, including time to position car, attach shaker, and open hopper door. Stockpiling is done by a 75′ Model PA-80 heavy-duty portable conveyor, which permits storage of up to 2,500 tons in a single circular pile.

Material is reclaimed by two Barber-Greene permanent conveyors, a 40′ channel frame unit located in a tunnel under the pile and a 172′ truss-type conveyor that charges the bins in the batch tower. Gates over the tunnel conveyor permit independent reclaiming of sand, gravel, and stone.

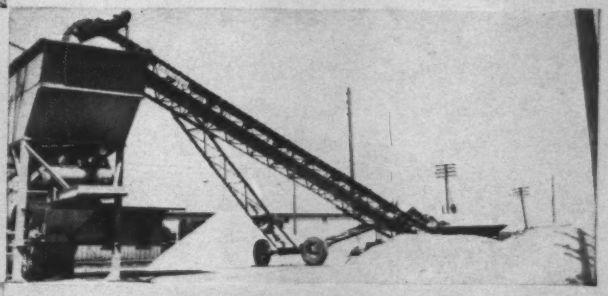
You can get this same top performance by calling in your Barber-Greene distributor next time you have an unloading, stockpiling, or screening problem. He sells the only complete line of portable conveyors, portable screening plants, and hopper car unloaders. And each model has a world-wide reputation for efficient, dependable performance.

Barber-Greene's complete line gives you more conveyor for your money



PORTABLE SCREENING PLANTS—The all-new Model PS-70 with exclusive Vibra-Spring screen suspension that doubles shock resistance and spring life, delivers capacities to 700 tph. Single deck model tows over the highway without disassembly, needs no overhead or ground screen supports. Double deck PS-70's have quick attach screen mounting. Both are fed by interchangeable hopper or trap.

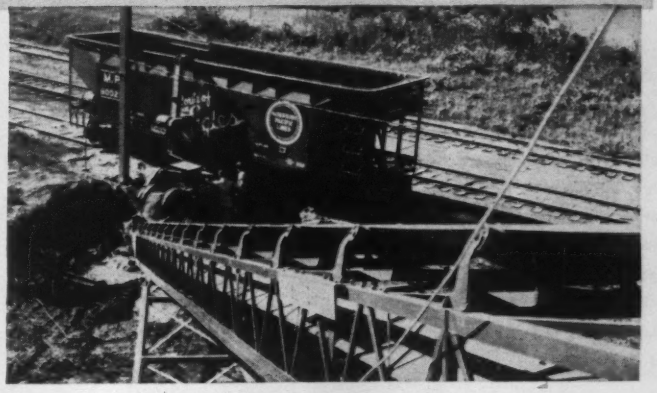
HEAVY-DUTY PORTABLE CONVEYORS—P-70 Series offers choice of torque-arm V-belt, or lineshaft drive, gasoline or electric power. Lengths range to 60' and capacities to 630 tph. Rugged construction throughout permits these units to take even the toughest punishment in stride. Accessories available for every job requirement.



CHANNEL-FRAME PORTABLES AND UNLOADERS—Channel-frame portable conveyors are available in lengths to 40' for capacities to 200 tph. Lineshaft drives require virtually no maintenance. Model 358 Car Unloader operates either above or below rails, has positive belt drive that prevents slippage, even when started under full load.

Long reach of 75' Model PA-80 Portable Conveyor allows user to build 2,500-ton radial stockpile. Other Barber-Greene portables are available in lengths up to 100' or more.

Note aggregates spewing from Model 358 Car Unloader at 3½ t.p.m. onto rugged 75' PA-80 Portable Conveyor that builds the radial stockpile.



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MIDDLE WEST

HEAVY CONSTRUCTION—BA

▲ **Ill., Chicago**—BA 7/18—Bd. Comrs. Cook Co., County Bldg., Zone 2, BIT. PAVING; SHOULDERS, Proj. 0707.1, 0104, 0707.1, 0105, 0505.5, 0303.3, 0910.1, 0606, $538,000;
BIT PAVING, C & G, PAVE REPLACE; STORM SEWERS, Proj. 1920-MFT, $469,000;
BIT. PAVING Pulaski Rd.; C & G; SEWERS, Proj. 1818.3, $550,000;
BIT. PAVING Central, Desplaines and Ridgeland Avenues at 47th St., Proj. 0303.2, 0303.1, 0103-1212.2, Lyons, $325,000;
LANDSCAPING South Rte. Express between 97th and 79th Sts., Proj. 066-1517, $229,000;
BIT. PAVING Franklin, Lincoln, McCormick, Wolf, Montrose and Talcott Rds., $143,000;
CONCRETE PAVING Church St.; 3,379 ft. STORM SEWERS, Proj. 121-0507, $358,000;
CONCRETE PAVING Lake-Cook Rd., Proj. 100-1719, $180,000;
LANDSCAPING South Rte. Express, 79th to 69th Sts., Proj. 066-1818-2, $138,000. CD 12/28/60.

▲ **MICHIGAN**—BA 11/8—State Hy. Dpt., 732 Mason Bldg., Lansing 26, ROAD,
100 mi. U. P. highways, incl. 20.5 mi. Interstate 75 Freeway between St. Ignace and Sault Ste. Marie, Upper Peninsula. $10,300,000.

BUILDINGS—BA

▲ **Wis., Brussels**—BA 7/24—Southern Door County School Dist. No. 1, HIGH SCHOOL, $1,000,000. Plans deposit $35. R. N. LeVel & Assocs., 1000 W. College Ave., Appleton, archts. CD 12/9/60.

▲ **Wis., Whitewater**—BA 7/25—Bd. Regents, State Colleges, Madison, two DORMITORIES, $1,600,000. Plans deposit $50. Sanstedt, Knopp & Yarbro, 103 Otter St., Oshkosh, archts. R. D. Culbertson, state engr. CD 4/7/61.

▲ **O., Youngstown**—BA 7/25—Youngstown Metropolitan Housing Authority, 976 W. Federal St., 348 unit HOUSING. $5,259,906. CD 2/19/59.

HEAVY CONSTRUCTION—LB & CA

▲ **Rock Road Constr. Co.**, 5915 North Rogers Ave., Chicago, Ill., CA **$1,099,936**, GRADE, PAVE South Rte. Express, Cottage Grove to 107 and Doty, No. 066-1213.1-CF, CHICAGO, ILL. Cook County Commrs., County Bldg., Chicago, Zone 2, Ill. BA 6/6/61. CA 6/19/61. CD 6/12/61 under LB.

▲ **Consolidated Constr. Co.**, 6350 N. Clark St., Chicago, Ill., LB **$1,733,717**, 5-span WF beam Pershing Rd. BRIDGE, South Rte. Expressway, Proj. 80.68-61-10, CHICAGO, Ill. Dpt. Purchases, City Hall, Chicago 2, Ill. BA 6/22/61. CD 6/2/61.

▲ **Economy Plumbing & Heating Co.**, 7777 Grosse Point Road, Skokie, Ill., CA **$1,869,000**, UTILITIES TUNNEL, O'Hara Airport, Park Ridge, 80.85-61-143, CHICAGO, ILL. Dpt. of Purchases, City Hall, Chicago 2, Ill. BA 6/7/61. CD 6/14/61, under LB.

BUILDINGS—LB & CA

▲ **Consolidated Products Co.**, c/o Azar-Denholm Realty Co., Akron Savings & Loan Bldg., Akron, O., Owner Builds, **$3,000,000**, 150 Parkway Estates HOMES, off N. Portage Path, AKRON, O.

▲ **Snider Bldg. Corp.**, 5251 Turney Rd., Garfield Heights, O., Owner builds **$2,000,000**, SHOPPING CENTER, Rte. 82 and 21. BRECKSVILLE, O.

▲ **Frank Messer & Sons, Inc.**, Paddock Rd., Cincinnati O., LB **$4,227,800**, est. $4,350,000 (6 bidders), twelve, 2 story row hi-rise APARTMENTS, Linn St. CINCINNATI, O. Cincinnati Metropolitan Housing Auth., 595 Armory Ave., Cincinnati, O. BA 6/22/61. CD 5/23/61.

▲ **H. B. Reichle, Inc.**, Waterville, O., Owner Builds, **$2,000,000**, 160 HOMES, Crestwood Addn., WATERVILLE, O.

▲ **Corvetta Constr. Co.**, 208 S. LaSalle St., Chicago, Ill. CA **$10,000,000**, 12 story HOSPITAL, 2900 Lake Shore Dr. CHICAGO, ILL. St. Joseph's Hospital, 2100 Burling St., Chicago, Ill. BA 6/13/61. CD 5/10/61.

▲ **B. W. Handler Constr. Co.**, 223 W. Jackson Blvd., Chicago 6, Ill., CA **$1,600,000** est. $1,800,000 John Crerar LIBRARY, CHICAGO, ILL. Illinois Institute of Technology, 3300 S. Federal St., Chicago, Ill. BA 5/25/61. CA 6/16/61. CD 5/8/61.

▲ **Beacon Constr. Co.**, 100 Hano Stadium, Boston, Mass., LB **$1,765,288**, (2 bidders). CAPEHART HOUSING, U. S. Naval Training Center, NBY (CH) 35705, Spec. 35705/61, GREAT LAKES, ILL. Dist. P. Wks., Ninth Naval Dist., Bldg. 1-A, Great Lakes, Ill. Yost & Taylor, 500 Green Bay Road, Kenilworth, Ill., archts. BA 5/25/61. CD 4/25/61.

MISSISSIPPI TO ROCKIES

HEAVY CONSTRUCTION—BA

▲† **Arkansas**—BA About 7/20—U. S. Eng., P. O. Box 867, Little Rock, BANK STABILIZATION, consisting of approx. 12,500 lin. ft. excavation, revetment, and dike, Willow Bar Cut-off; approx. 1,500 lin. ft. revetment, left bank Fourche Place Cut-Off, approx. River Mile 159.7, Fourche Place Cut-Off, between River Mile 159.7 to River Mile 155.0, Arkansas River Watershed, Arkansas River, CIVENG-03-050-61-84, $1,000,000. CD 9/30/59.

BUILDINGS—BA

▲ **Tex., Houston**—BA 7/27—Houston Ind. School Dist., 1300 Capitol Ave., Junior High SCHOOL, north of Highland Heights School, $1,005,800. Ben F. Greenwood, 2265 W. Holcombe Blvd., Houston, and Harvin C. Moore, 2037 Lexington, Houston, coord. archts. Walter P. Moore, 2 Pinedale St., Houston, engr. CD 5/21/59.

HEAVY CONSTRUCTION—LB & CA

† **Martin K. Eby Co.**, 610 North Main St., Wichita, Kan., CA **$37,597,752**, Titan II, Phase II, CONCRETE WORK, EARTHWORK, paving, metal arch cableway, metal silo doors and appurtenances, metal platforms, interior and exterior electrical sys., domestic and fire water sys., security fencing; installation of government-furnished equipment consisting of hydraulic and pneumatic sys., pumps and valves for water sys., heating, ventilating and air-conditioning equipment, standby power generators and fire detection and alarm devices, etc., eighteen separate Complexes near Mc Connell Air Force Base, IFB ENG-04-538-61-37B, WICHITA, KAN. Director, Titan II Constr. Directorate, Corps of Engineers, Ballistic Missile Constr. Office, Air Force Unit P. O., Los Angeles, Zone 45, Calif. BA 6/15/61. CD 6/27/61 under LB.

▲† **Southern Constr. Co.**, Box 1307, Augusta, Ga., CA **$1,046,397**, imprvt. AIRMEN BARRACKS, San Antonio, LACKLAND AIR FORCE BASE, TEX. Base Procurement Office, Bldg. 6211, Lackland Air Force Base, Tex. BA 6/12/61. CD 6/22/61, under LB.

FAR WEST

HEAVY CONSTRUCTION—BA

▲ **CALIFORNIA**—BA 8/3—State Div. Hys., 120 South Spring St., Los Angeles, ROAD,
Ventura Co.—grading, paving 5.5 mi. four lane freeway, State Sign Rte. 126 between US Hy. 101, Ventura and 0.1 mi. east of Wells Rd. $3,921,000. CD 12/5/60.

BUILDINGS—BA

▲ **Calif., Sunnyvale**—BA 7/11—Fremont Union High School Dist., Box 125, 140,000 sq. ft. Fremont HIGH SCHOOL No. 4, incl. swimming pools, Homestead Rd., Cupertino. $3,000,000. Plans deposit $100. Masten, Hurd, Gwathmey, 526 Powell St., San Francisco, Calif., archts. Earl & Wright, 49 Fremont St., San Francisco, Calif., engrs. CD 3/30/61.

▲ **Hawaii, Honolulu**—BA 7/13—University of Hawaii, Bd. Regents Bachman Hall, University and Wilder Aves., Proj. EW-HRD-1, high rise DORMITORY, EW-LRD-1, low rise DORMITORY; EW-TQ TRANSIENT QUARTERS; EW-AFS ADMINISTRATIVE FOOD SERVICE. Extended date. $6,300,000. Plans deposit $200. Clifford Young and I. M. Pei, Rm. 207, 931 University Ave., Honolulu, Hawaii, archts. CD 5/19/61.

HEAVY CONSTRUCTION—LB & CA

▲† **Manson Constr. Co.** and **Osberg Constr. Co.**, 1132 N. 128 St., Seattle, Wash., CA **$1,255,025** IMPRVTS. to Homer and Seldovia small boat basins and DREDGING front of ocean dock, Anchorage, INV-61-6, ALASKA. U. S. Eng., P.O. Box 7002, Anchorage, Alaska. BA 6/6. CD 6/26/61, under LB.

▲ **IDAHO**—State Dpt. Hys., 3211 State St., Boise, ROAD,
Murphy Bros., E 3728 Broadway, Spokane, Wash., CA **$2,436,951** (5 bidders) 4-lane divided roadway, drainage, structures, plantmix bit. surf. two concrete underpasses, two concrete bridges, 3.901 mi. Interstate 90 between 4th of July Canyon and Dudley Interchange, Proj. I 90-1(9)34. Kootenai Co. BA 6/20/61. CA 6/21/61. CD 6/2/61.

▲ **UTAH**—State Rd. Comn., Utah State Office Bldg., Salt Lake City, Zone 14, Bids opened 6/20, ROAD,
LaGrand Johnson, 639 East First South, Logan, Utah, LB **$1,025,883**, est. $1,140,000, (7 bidders), plant mixed bit. surf. 10.828 mi. Interstate 15 between Brigham and Elwood, Box Elder Co. CD 6/7/61.

▲ **Western Contg. Corp.**, 316 Crandall Bldg., Salt Lake City, Utah, LB **$1,645,330**, HEATING SYSTEM EXTENSION, Utah University, SALT LAKE CITY, UTAH. State Bldg. Bd., 419 State Capitol, Salt Lake City, Utah. BA 6/15/61. CD 6/1/59.

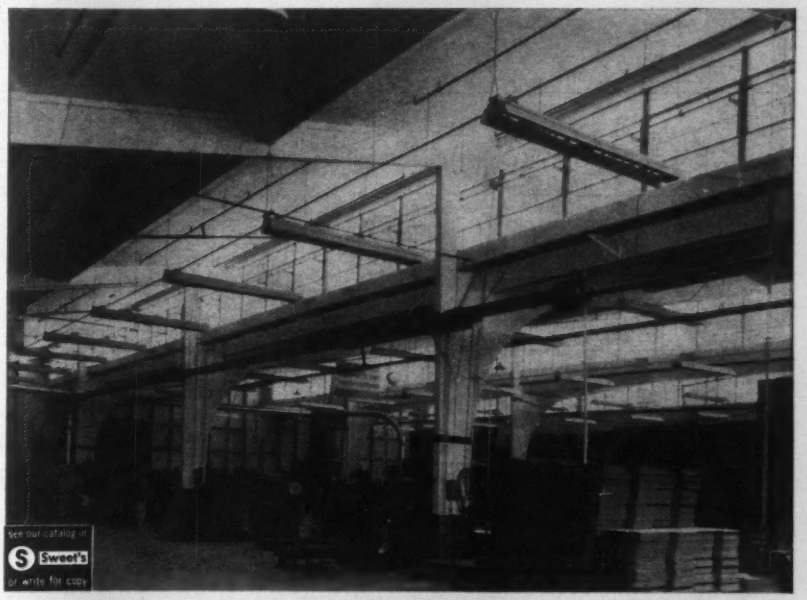
▲ **CALIFORNIA**—State Div. Hys., 1120 N St., Sacramento, ROAD,
Ball & Simpson, 685 Delaware St., Berkeley, Calif., CA **$5,547,943** grading, surf. 5.7 mi. four lane freeway, US Hy. 101 between Maple Hills Rd. Bridge south of Miranda and Myers Flat incl. five bridges, Humboldt Co. BA 6/7. CD 6/9/61 under LB.

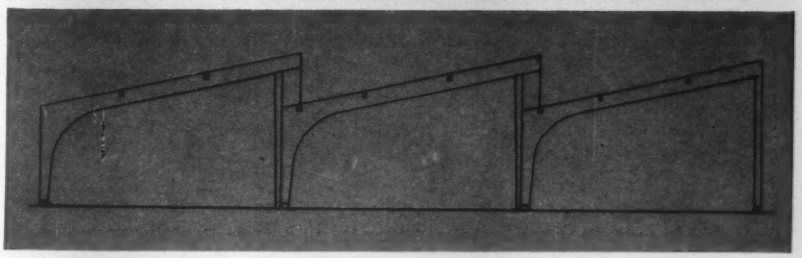
▲ **CALIFORNIA**—State Div. Hys., 120 South Spring St., Los Angeles, bids opened 6/22, ROAD,
Peter Kiewit Sons' Co., 345 Kieways Ave., Arcadia, Calif., LB **$4,315,900** (4 bidders) grading, paving 2 mi. 8 lane divided freeway on San Diego Freeway between Hawthorne Blvd. in Lawndale and 135 St. in Hawthorne, Los Angeles Co. CD 6/12/61.

▲ **F. E. Young Constr. Co.**, P.O. Box 2872, San Diego, Calif. and Scott Co. of Southern California, 400 W. Temple St., Los Angeles, Calif. LB **$9,291,408** LOWER FEEDER WATER TREATMENT PLANT and 25 m.g. underground RESERVOIR, Yorba Linda, LOS ANGELES, CALIF. Metropolitan Water Dist. of Southern California, 306 W. 3 St., Los Angeles, Calif. BA 6/21 CD 6/13/61.

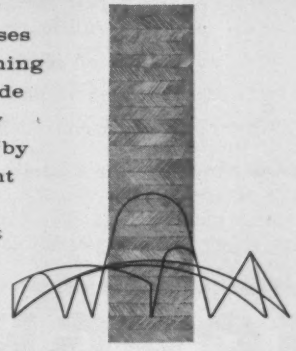
Container plant of International Paper Company, Pinedale, California. Engineer: David R. Edwards, Maywood, California. Contractor: E. A. Hathaway, Inc., San Jose, California.

Space provided: 25,000 square feet for manufacturing, warehousing and shipping; 3,000 square feet of office space. *Structural framing:* Tudor half-span arches used as rigid frames; glulam purlins. Arches are spaced at 40'. *Exterior walls:* exterior grade plywood and battens for main building; Texture One-Eleven plywood for office wing. *Interior walls:* painted plywood. *Floor:* vinyl tile in office areas; hardened concrete in plant sections. *Roof:* built-up felt over plywood skin. *Heating and air conditioning:* forced air for both cooling and heating. *Lighting:* fluorescent fixtures in both offices and plant. *Area:* 28,000 square feet. *Cost of roof framing:* including arch bents, glulam purlins and beams, sawn columns and end wall bracing, $0.868 a square foot erected in place.





Typical of imaginative yet practical uses of engineered timber structural framing are these Tudor arches which provide a sawtooth roof contour for clerestory lighting. They were manufactured by Timber Structures, Inc. under constant quality control which assures their permanence and excellent performance on the job.



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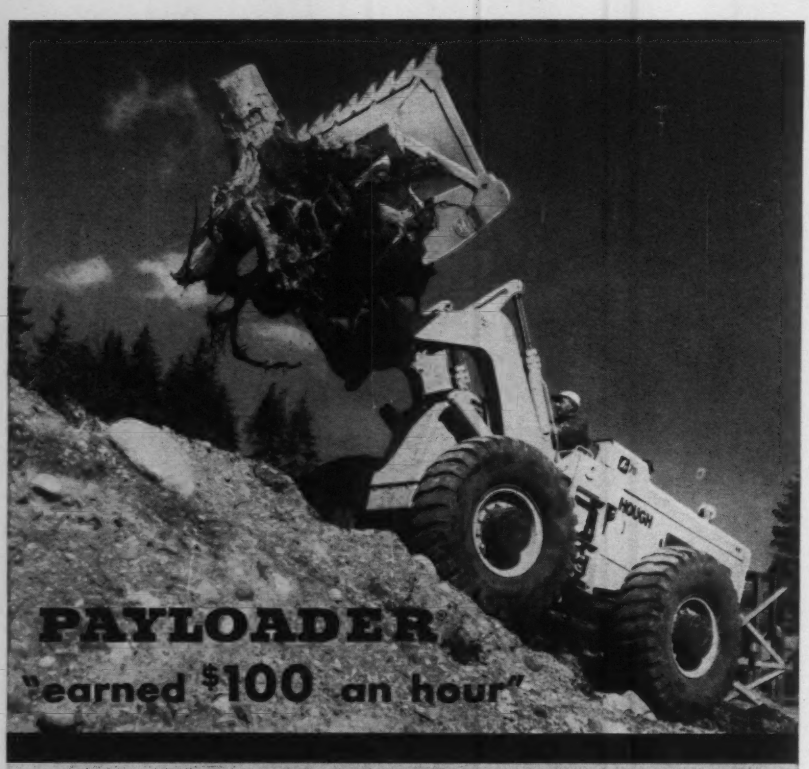

The above words of a job superintendent tell how a "PAYLOADER" tractor-shovel with Drott "4-in-1" Bucket paid off on a tree and stump removal contract.

Mobility and multi-purpose usefulness are the two big advantages of this "4-in-1" combination that enable its owners to do more jobs, reduce equipment investment, cut labor costs and make more money. Many other users tell us how valuable and versatile these machines are for right-of-way and land-clearing operations, plus the usual tractor-shovel applications. For example:

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"We use it for just about any job you can name . . . fell trees, pick-up stumps, rocks."

"We save 90% of clean-up costs with the '4-in-1' unit."

"It's like a magic wand as it can do so many things."

"Most useful single machine in my 15 years' experience."

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▲ **R. A. Wattson Co.**, Box 679, North Holywood, Calif., CA **$1,584,867** LEVEE FACING and invert for Ballona Creek, Pacific Ave. to Centinela to LaSalle Ave., Culvert City and Los Angeles, LOS ANGELES, CALIF. Los Angeles County Flood Control Dist., 2250 Alcazar St., Los Angeles, Calif. BA 6/9 CD 6/13/61 under LB.

▲† **Paul Hardeman Inc.**, 10579 Dale Ave., Stanton, Calif., LB **$8,909,581** (2) **$3,539,559**, LAUNCH COMPLEX No. 2, Naval Missile Facility, Point Arguello. Spec. 36856, POINT MUGU, CALIF. 11th Naval Dist. P. Wks., 1220 Pacific Hy., San Diego 1, Calif. Kaiser Engineers, Kaiser Center, Oakland 12, Calif., engrs. BA 6/26. CD 5/23/61.

▲ **MacDonald, Young & Nelson, Inc.**, 8907 Railroad Ave., Oakland, Calif., CA **$3,000,000**, 70-bed rein.-con. HOSPITAL ADDN., OAKLAND, CALIF. Merritt Hospital, Hawthorne Ave. and Webster St., Oakland, Calif. Stone, Marraccini & Paterson, 536 Mission St., San Francisco, Calif., archts.

▲ **Howard J. White Inc.**, 70 Welch Rd., Palo Alto, Calif., CA **$2,675,000**, 2 story Donald B. Tresidder MEMORIAL UNION, Santa Teresa St., PALO ALTO, CALIF. Stanford University, Bus. mgr., Encina Hall, Stanford Univ., Palo Alto, Calif. BA 5/26. CD 6/2/61 under LB.

▲ **Allison Honer Co.**, 312 N. Main St., Santa Ana, Calif., CA **$2,244,888** est. $2,752,000, 3 story, concrete HUMANITIES BLDG. Proj. 905009, RIVERSIDE, CALIF. Bd. Regents University of California, Admin. Bldg., Riverside, Calif. BA 6/6. CD 6/8/61 under LB.

BUILDINGS—LB & CA

▲ **A. H. Green Corp.**, 4341 E. Vernon Ave., Phoenix, Ariz. Owner Builds, **$3,000,000**, ($600,000 1st year) 320 unit MOTOR HOTEL, north of Glen Canyon Dam, north of here, PAGE, ARIZ.

▲† **Mahout Constr. Co.**, 190 Marion Way, Colton, Calif., CA **$1,176,741**, TEST CELL D, COMPLEX, buildings and utilities, Nevada Test Site, MERCURY, NEV. Atomic Energy Comn., 1233 S. Main St., Las Vegas, Nev. BA 6/15/61. CD 6/20/61 under LB.

▲ **Selkirk Co.**, 1508 S. Chestnut St., Spokane, Wash., LB **$1,561,267** (7 bidders) nine, 1 story, 202,000 sq. ft. HIGH SCHOOL bldgs., SPOKANE, WASH. School Dist. No. 1, W. 503 4th St., Spokane, Wash. BA 6/21/61. CD 6/2/61.
James Smyth Plumbing & Heating Co., N. 216 Division St., Spokane, Wash. LB **$552,249**, (7 bidders), mechanical contract, HIGH SCHOOL, (Spokane, Wash.).

CANADA

HEAVY CONSTRUCTION—LB & CA

▲ **BRITISH COLUMBIA**—B. C. Govt., Parliament Bldgs., Victoria, ROAD,
Ben Ginter Constr. Co., Ltd., 1633 1st Ave., Prince George B. C., CA **$2,078,130**, 31.87 mi. Cassiar-Stewart Hy., Strohn Creek to Bell Irving River Section, Contract No. 1138. BA 6/1/61. CA 6/15/61. CD 6/8/61 under LB.

FOREIGN

HEAVY CONSTRUCTION—BA

▲ **Pakistan**—BA 7/31—Chief Engineer, Karachi Development Auth., Victoria Rd., Karachi, 16,000 ft. stone-faced concrete WALL along Sea Front, Clifton. $1,-800,000. Deposit $21,000. CD 7/30/58.

▲ **Spain, Seville**—BA 8/1—OICC, Edificio Espana, Madrid, Spain, YARDS, DOCKS and COMMUNICATIONS BLDGS., Rota, Moron (Andalusia). $1,000,000. Specifications, blueprints obtainable at request to interested.

▲ **India**—BA 9/1—Chief Engineer, Hydro-Electric Constr. Proj., Race Course Cross Rd., P.B. 60, Bangalore 1, India, six surface steel PENSTOCKS, 2nd Stage, Sharnvathi Valley Hydro-Electric Works. $5,700,00. Plans deposit $10.50.

LATIN AMERICA

HEAVY CONSTRUCTION—BA

▲ **ARGENTINA**—BA 7/14—Direccion Nacional de Vialidad, Avda Maipu 3, Buenos Aires, ROAD, 31.936 kilom. bit. surf. and basic works incl. 7 rein.-con. bridges, Rte. 34, Piquirenda-Pocitos, Salta Province, Salta. $1,409,685.

▲ **Argentina**—BA 8/23—Dir. Provincial Energia Primera Junta 2558, 20, Santa Fe City, 116 mi. 33 kv TRANSMISSION LINES, 9 meter stations, transformer stations and primary distribution lines, trans. stations 33/0, 38-0, 22 kv, Santa Fe Prov. Tender No. 59A. $1,587,000; 130.2 mi. 33 kv H/T LINES serving 17 localities, five transformer substations, 33/9, 38-0, 22 kv, Santa Fe Prov., Tender No. 59B. $1,048,000.

HEAVY CONSTRUCTION—LB & CA

▲ **ARGENTINA**—National Hy., Dpt. Argentina Republic, Avenida Maipu, Buenos Aires, ROADS,
Polledo SA, Venezuela, 925, Buenos Aires, and **Perales Aguiar SRL**, Venezuela 736, Buenos Aires, Argentina, CA **$6,173,062** Group 1, 167.8 kilometers bit. tarred hy. Rte. 18 and Rte. 14 incl. reconditioning of basis works Entre Rios Province, Parana-Villaguay A. Sandoval-S, Salvador; CA **$4,583,279** Group 2, 101.7 kilometers bit. tarred hy. Rte. 126, Entre Rios Province, jct. R.127-La Paz. La Paz-Arroyo Hondo. BA 4/28. CD 5/17/61, under LB.

PROPOSED PROJECTS

WATER SUPPLY

O., Willoughby Hills (P. O. Box Willoughby)—Village, Village Hall, WATER LINES. $700,000.

SEWERS, WASTE DISPOSAL

▲ Ill., Clinton—City, City Hall, $2,500,000 referendum election June 27, SEWER SYSTEM EXTENSIONS. CD 1/19/61.

▲ O., Cleveland—City, City Hall, Zone 14, bond election Nov. 7, SEWERS, $6,000,000.

STREETS AND ROADS

▲ O., Cleveland—City, City Hall, Zone 14, bond election Nov. 7, PAVING, $4,000,000. CD 11/11/57.

▲ Wash., Seattle—City, County—City Bldg., GRADING, Linden Ave. and adjacent streets, $1,275,326. R. W. Morse, city engr.

EARTHWORK, WATERWAYS

▲ California—Bd. Supervs. Placer Co. Water Agency, County Courthouse, Auburn, voted $140,000,000 bonds June 20, six DAMS, 4 POWERHOUSES with total installed capacity 216,000 kilowatts and 21.7 mi. TUNNELS, Middle Fork of American River Proj. northeast of Auburn. McCreary-Koretsky, 5675 Freeport Blvd., Sacramento, Calif., engrs. Constr. to start in about 2 years. CD 5/11/61.

AIRPORTS

▲ Calif., San Jose—City, City Hall and San Jose Municipal Airport, Admin. Bldg., Spring and Newhall, San Jose, plans by Hollis Logue, 31 Fountain St., San Jose, Calif., 2 story 45,000 sq. ft. rein.-con. TERMINAL BLDG. $1,400,000. CD 2/13/61.

▲† N. C., Cherry Point—Dist. P. Wks. Office, 5th Naval Dist., Marine Corps Air Station, Norfolk, Va., Plans by J. N. Pease & Co., 2925 N. Independence Blvd., Charlotte, two HANGARS, Marine Corps Air Station, $2,000,000. CD. 8/1/60.

UNCLASSIFIED

▲ Georgia—Jackson Electric Membership Corp., Jefferson—ELECTRICAL DISTRIBUTION LINES and SUBSTATIONS, Jackson County, $1,500,000. Southern Engineering Co. 1000 Crescent Ave., NE Atlanta, Ga. consult. engr.

▲ O., Cleveland—City, City Hall, Zone 14, bond election Nov. 7, RECREATION FACILITIES, incl. five swimming pools, $3,000,000. CD 2/25/60.

▲ Texas—Louisiana—Texas Eastern Transmission Corp., P. O. Box 1189, Houston, Zone 1, 290 mi. LPG LINE, between New Orleans, La. and Mont Belvieu, Tex. $4,860,000. Bids early 1962.

▲ Texas—Oklahoma—Phillips Pipeline Co., Battlesville, Okla., 26.75 mi. 12 in. 19½ mi. 8 in., 30 mi. 6 in., and 47 mi. 4½ in. CRUDE LINE, area Beaver, Beaver Co., Okla., to Borger, Tex., $1,530,000. CD 7/19/56.

AMERICANS ABROAD

▲† Liberia, Monrovia—U. S. Information Agency, Contract & Procurement Div., 1776 Pennsylvania Ave. N.W., Wash. 25, D.C., U.S.A., RADIO BROADCASTING FACILITIES. $12,627,000. Page Communications Engineers, Inc., 710 14 St. N.W., Wash., D.C., U.S.A., consult. engr. Bids will be considered only from prequalified firms. Interested firms should submit qauilfications not later than July 7, 1961. CD 8/19/59.

PUBLIC BUILDINGS

▲ Ark., Trumann—City Housing Auth., City Hall, 200 low-rent HOUSING units, $2,580,000.

▲ Calif., Los Angeles—University of California at Los Angeles, 405 Hilgard Ave., plans by Carl C. McElvy, c/o Owner, 7 story men's and women's RESIDENCE HALL. $5,000,000. Welton Becket & Assocs., 5657 Wilshire Blvd., Los Angeles 36, Calif., consult. archts.

▲ Conn., New Haven—State P. Wks. Dpt., 165 Capitol Ave., Hartford, plans by Pederson & Tilney, 175 Whitney Ave., and Shepley, Bullfinch, Richardson & Abbott, 122 Ames Bldg., Boston, Mass. Proj. BI-MH-3 Connetcicut Mental HEALTH CENTER, near Grace-New Haven Community Hospital, $2,000,000. Henry A. Pfisterer, 111 Whitney Ave., New Haven, Conn. consult. engr. Jos R. Loring & Assocs., 110 W. 47th St., New York, N. Y., mech. engrs. Jerome F. Mueller, 15 Lewis St., Hartford, Conn., elect. engr. CD 11/18/59.

▲† Mich., Detroit—General Services Admin., 19 and F Sts. N. W., Wash., D. C., POST OFFICE and COURTHOUSE alterations. $4,628,000 (No appro.).

▲ Minn., Brainerd—State Dpt. Admin., 19 State Capitol, St. Paul, four 108-bed PATIENTS BLDGS., Brainerd State School and Hospital. $2,000,000. Bids within 2 years. CD 2/7/58.

▲† Minn., St. Paul—General Services Admin., 19 and F Sts. N. W., Wash., D. C., COURTHOUSE and FEDERAL OFFICE $11,673,000 (No. appro.).

you can't PATCH IT!

Some things can't be patched, let's face it. Among them are a bond issue and a sewer line. If either fails, you start all over again—and that's expensive.

If your city puts inferior sewer pipe in the ground—and gases and acids ruin it—somebody's got to dig it up and replace it. That costs you—the taxpayer—a whole lot more money than putting down lifetime pipe in the first place.

Putting in an inferior sewer pipe is a real penny-wise, pound-foolish idea, anyway. The big cost of putting in a sewer line is tearing up streets and digging the ditch, NOT the pipe. Actually the pipe—the best, lifetime pipe—averages about only 12 percent of the cost of the job.

Lifetime pipe is Vitrified Clay Pipe. It can save you untold tax dollars in the long run.

No, you can't patch a sewer line any more than you can a bond issue. But you can patch a hole in your money pocket—and the time to patch it is before you've lost a lot of money. That means demanding lifetime pipe—Vitrified Clay Pipe—for the next sewer line in your community.

Public health is important. Your city may need to upgrade its sewer lines.

Find out how by writing to:

NATIONAL CLAY PIPE MANUFACTURERS, INC.
1028 Connecticut Ave., Washington, D. C.

Please send me full details on the new factory-made compression joints on Clay Pipe.

(name)

(company)

(street address)

(city and state)

B-4C23 EN

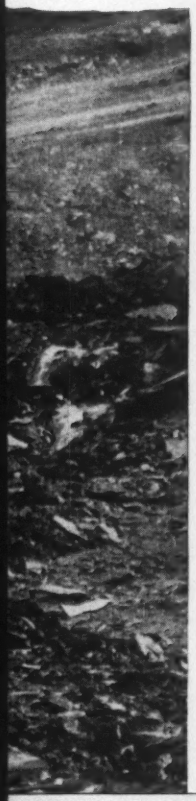
COMPRESSION SEALED, VITRIFIED
CLAY IMPERVIOUS PIPE
THE STANDARD in SANITARY SEWERS

NATIONAL CLAY PIPE MANUFACTURERS, INC.
1028 Connecticut Avenue, N.W.
Washington 6, D. C.

"EUC" TC-12 . .

Your Euclid dealer will be glad to show you what a TC-12 can do in stepping up production and protecting profits on ripping work.

. . Best Ripper, Bar None!



Before you drill or shoot . . . be real sure that a TC-12 can't do the job

With up to 35% more net h.p. and far more work capacity than other "big" crawlers, the Euclid TC-12 has almost unbelievable ripping ability. On job after job, full-power shift TC-12's are ripping rock that the biggest competitive tractors can't handle.

This unmatched ability to rip tough materials has greatly extended the use of scrapers and cut earthmoving costs on a wide range of work. On jobs that would ordinarily call for drilling, shooting and shovel loading, a TC-12 with ripper often permits the use of scrapers and provides a big saving in yardage costs. Equipped with dozer and ripper, the "Euc" is a versatile tractor capable of doing more work on any job . . . and doing it faster at lowest possible cost.

- **More weight and net h.p.**
  (100,000 lbs. — 425 total net h.p.)
- **Better Balance and Tractive Ability**
- **Rugged Design of Rippers**
- **Complete line of ripping attachments**

A new answer to "is it rippable?"

Prior to the availability of the big Euclid TC-12, material that couldn't be ripped by other tractors had to be drilled and blasted for shovel loading or dozing. Now with the power and traction of the Twin Crawler, you can rip rock and other material that simply isn't rippable with even the biggest competitive tractor. Here are a few of the jobs where a TC-12 can cut costs to new lows for tough materials:

Airport Construction...Highway Cuts
Mines and Quarries...Missile Bases
Dam Construction...Industrial Grading
Pipeline Work...Logging Haul Roads

GM GENERAL MOTORS EUCLID

EUCLID

DIVISION OF GENERAL MOTORS, HUDSON, OHIO
Plants at Cleveland and Hudson, Ohio and Lanarkshire, Scotland

CUT WATER SUPPLY COSTS with REDA Submergible PUMPS

. . . and still obtain maximum water supply and maximum pressure for ALL your water needs. Here's Why:

1. QUALITY CRAFTSMANSHIP . . . Yet production line cost . . . A complete line of 2-pole and 4-pole models to meet operating heads and capacities required. Both electric, submergible motor and pump are REDA manufactured.

2. Oil lubricated motors require less power per H.P. PROVIDE MORE WATER PER DOLLAR than comparable units.

3. Low Installation and Operating Cost. No special piping needed, no drive shafts, rods, belts or gears or costly foundations are required. Operation is completely automatic with minimum controls required.

PUMP TYPE	UNIT O. D.	DESIGN CAPACITY GPM	DESIGN LIFT HEAD IN FEET	
			MAXIMUM	MINIMUM
D-47E	6″	55	2000	200
G-70E	6″	72	5400	180
G-120A	6″	110	3500	105
G-160	6″	150	2750	82
I-200	8″	210	2000	54
FR-300	8″	325	1250	54
J-400	8″	480	780	60

PUMP TYPE	UNIT O. D.	DESIGN CAPACITY GPM	DESIGN LIFT HEAD IN FEET	
			MAXIMUM	MINIMUM
GB-600	10″	600	600	60
KG-725	10″	800	490	69
N-500	10″	425	1100	30
N-750	11″	(c)600*	1000	30
		(a)700		
P-1000	12″	1200	1000	46
R-1500	14″	1800	700	65
T-2000	16″	2250	600	85

*(c) and (a) designate impeller cut within the same pump type.

Models Available from ⅓ to over 300 H.P. Call or Write for Industrial Bulletin R-432 and more complete information.

REDA PUMP COMPANY / BARTLESVILLE, OKLAHOMA

Manufacturer of Submergible, Electric Motors and Pumps for over 40 years. Pumps for Oil, Brine, Water, Gasoline, Jet Fuel, Chemicals, LPG

SIGN OF QUALITY SUBMERGIBLE REDA PUMPS

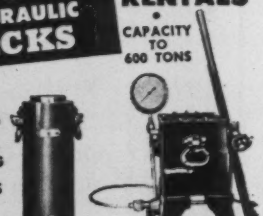
PHONE FE 6-7900

DUDGEON HYDRAULIC JACKS

SALES RENTALS

CAPACITY TO 600 TONS

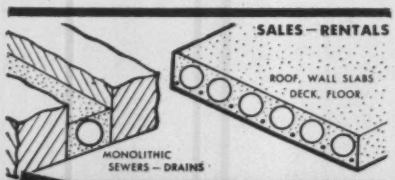
FOR:
- PILE TESTING
- UNDERPINNING
- BRIDGES
- PIPE PUSHING
- SOIL TESTING



Write to Dept. R

RICHARD DUDGEON INC.

789 BERGEN ST. • ST 6-4040 • BROOKLYN, N. Y.



NEW! **VOIDS IN CONCRETE with ELGOOD INFLATABLE VOID FORMS**

REUSABLE RUBBER VOID FORMS FOR SEWERS, SLABS, DRAINS & DUCTS. SUPERSEDES ALL VOID FORMING TECHNIQUES.

- ALL DIAMETERS ¾″ TO 120″
- GUARANTEE MINIMUM OF 100 USES Field experience, 250-3000 uses
- STAFF AVAILABLE FOR SPECIALIZED PROBLEMS

ELGOOD CONCRETE FORMS CORP.

378 TEN EYCK ST., BROOKLYN, N.Y. HY 7-5445

▲ **N. Y., White Plains**—White Plains Parking Auth., 255 Main St., 4 story PARKING GARAGE, Main St. and Martine Ave. $2,000,000.

▲ **O., Cleveland**—City, City Hall, Zone 14, bond election Nov. 7, CITY TRAFFIC AND CIVIL COURT, $2,200,000. CD 11/11/59.

▲† **Pa., Harrisburg**—General Services Admin., 19th & F Sts., N. W., Wash., D. C., COURTHOUSE AND FEDERAL OFFICE, $7,470,000. (No appro.).

▲ **Utah, Salt Lake City**—Salt Lake City Corp., City-County Bldg., plans by Ralph A. Edwards, 1407 South 22nd E, 3 story LIBRARY, 5th S and 2nd E. $2,000,000.

▲ **Wash., Spokane**—General Services Admin., 19th and F Sts. NW, Washington, D. C., COURTHOUSE and FEDERAL OFFICE, $8,694,000 (no appropriation).

▲ **Wis., Madison**—Bd. Educ., 351 W. Wilson St., plans by John J. Flad & Assocs., 2525 University Ave., HIGH SCHOOL, $3,300,000.

COMMERCIAL BUILDINGS

▲ **Conn., Fairfield**—Fairfield Geriatrics Center, Inc., c/o Dr. C. Lewis Murdock, 267 Sport Hill Rd., Easton, plans by Raymond Brown, Jr., 125 Trumbull St., Hartford, GERIATRICS CENTER, Sport Hill Rd., $3,000,000.

▲ **Calif., Santa Barbara**—Fred Trevillian, c/o Mar Monte Hotel, Corona Del Mar Dr., plans by William C. Hall, 2 W. De la Guerra, Santa Barbara, Calif., Mar Monte HOTEL ADDN., 290 subterranean car lot, E. Cabrillo Blvd. $2,500,000. Bids middle July 1961.

▲ **N. Y., New York**—St. Vincent's Hospital, 7th Ave. and 11th St., New York 11, plans by Eggers & Higgins, 100 E. 42 St., New York 17, N. Y., 10 story RESEARCH CENTER adjoining Cardinal Spellman Pavilion, 133-141 W. 11 St. $4,000,000. CD 11/13/59.

▲ **N. Y., New York**—Irving and Hyman Shapiro, 20 E. 46 St., New York 17, plans by Herbert & Clarence Lilien, 1841 Broadway, New York 23, N. Y., 20 story, 354 unit, rein.-con. penthouse APARTMENT, 7 Ave., W. 14 and W. 15 Sts. $5,250,000. Batlan & Oxman, 230 W. 41 St., New York 36, N. Y., mech. engrs. Greenhut & Taffel, 114 E. 32 St., New York 16, N. Y., struct. engrs.

▲ **O., East Cleveland**—Arthur M. Kligler and Frank Virgin, 75 Public Sq., Cleveland, Zone 13, plans by Keeva Kekst, 3121 Euclid Ave., Cleveland, Zone 15, 10 story, 148 suite APARTMENT, Terrace Rd. between Noble and Allandale Rds. $3,000,000.

▲ **S. D., Sioux Falls**—Methodist Mission Council, Dr. E. E. Greenough, Pres., 1320 S. Minn., RETIREMENT CENTER, 100 cottages, dormitory, infirmary, and shopping center, Jct. I-29 & 41st St. $3,300,000. Bids part-fall.

▲ **Tex., Dallas** — Presbyterian Hospital, Presbyterian Foundation United, 901 W. Lancaster, 350 bed HOSPITAL, N. Central Expressway at Greenville Ave. and Glen Lakes Dd. $7,500,000. CD 7/13/60.

▲ **Va., Danville**—H. J. Bernstein, 118 S. 6th St., Richmond, plans by J. Albert Heisler, 709 W. Grace St., Richmond, Ballou Plaza SHOPPING CENTER, W. Main and Wooding Ave. $2,500,000. Bids in Summer. CD 6/14/61.

▲ **Wash., Seattle**—Providence Hospital, 17th Ave. and E. Jefferson St., UNDERGROUND HOSPITAL ADDN. for surgical facilities. $5,000,000.

▲ **Wis., Milwaukee**—Abe L. Swed, 729 N. Broadway, plans by R. C. Kurtz, 2003 W. Capitol Dr., OFFICE. $2,500,000. CD 8/11/60.

▲ **Ont., Glat**—Crosby Heights Developments, 1477 Eglinton Ave. W., Toronto, SHOPPING CENTRE, Dundas St. and Hy. 97. $2,000,000.

INDUSTRIAL BUILDINGS

▲ **Calif., Redwood City**—Crocker Land Co., 660 Market St., San Francisco, plans by Walter E. Mooney, 1229 Ulloa St., San Francisco 16, Calif., 1 story 287,000 sq. ft. precast tilt-up, exposed aggreg. wall panels, slab on grade WAREHOUSE, SHOP and OFFICE Crocker Industrial Tract. $1,250,000. Dohrmann Commercial Co., 984 Mission St., San Francisco, Calif., lessee. Constr. soon.

▲ **Fla., Tampa**—Ideal Cement Co., Denver National Bldg., Denver, Colo., WAREHOUSE-DISTRIBUTION CENTER, incl. 8 concrete silos, pack house, loading facilities, Port Sutton, $1,000,000.

▲ **Ga., Augusta**—Proctor & Gamble Co., 6th & Sycamore, Cincinnati, O., synthetic detergent MFG. PLANT, $4,000,000. A. M. Kinney, Inc., 2912 Vernon Place, Cincinnati, O. consult. engrs. CD 5/24/61.

▲ **N. Y., Garden City**—Endo Labs, Inc., 84-40 101 St., Richmond Hill, N. Y., plans by Paul Rudolph, Dpt. Architecture, Yale University, New Haven, Conn., PLANT to manufacture drugs, Meadowbrook Parkway, 8 acre site. $5,000,000.

▲ **N. Y., Oakdale**—Maxson Electronics Corp., Div. W. L. Maxson Corp., 475 10 Ave., New York 18, N. Y., ELECTRONICS PLANT, 2 bldgs. 250,000 sq. ft. total, 125 acres east of Connetquot Ave. between Sunrise Hy. and Montauk Hy. $2,000,000.

▲ **Tex., El Paso**—Utility Trailer Co., Ysleta, FACTORY, $1,500,000. Bids soon.

▲ **W. Va., Kopperston**—Eastern Gas & Fuel Assocs., Koppers Bldg., Pittsburgh, Pa., coal cleaning and preparation PLANT, $2,000,000. Bids July-Aug. 1961.

BRINGS COMPRESSED AIR ANYWHERE UNDER ITS OWN POWER!

Here's a self-propelled air compressor that eliminates *all* the dead time spent by conventional compressors waiting to be towed somewhere!

The Tractair is a 42-hp tractor and a 125-cfm air compressor. It brings air power to sites you'd fear to tread with truck-towed compressors. You can park it in a ditch or on a steep slope, attach the hose, and start drilling. When finished, the operator drives it to the next job — without waiting for a tow truck or men to jockey it into position. You can drive up close to the work, too, which means shorter hose . . . less hose damage . . . and full 125 cfm power at the tool.

The improved Tractair offers greater efficiency and fuel economy. It's designed for operator convenience . . . all-weather dependability . . . and the easiest servicing in the field. Add available attachments and you have a money-saving self-propelled air-plant for year-around construction and maintenance work.

Ask your Le Roi distributor for a free demonstration. Or write to Le Roi Division, Westinghouse Air Brake Co., Sidney, Ohio.

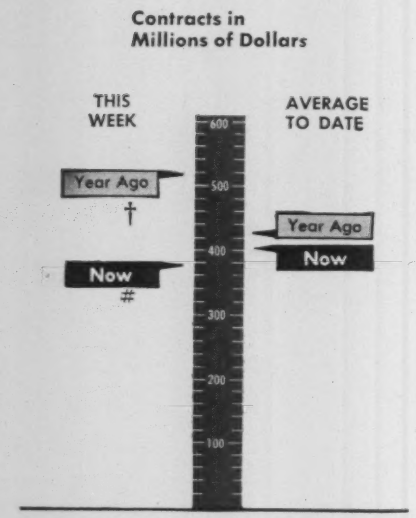
LE ROI TRACTAIR® AIR COMPRESSORS

T-91

PORTABLE AND TRACTAIR® AIR COMPRESSORS • STATIONARY AIR COMPRESSORS • AIR TOOLS

Construction Scoreboard

This Week . . .



AMOUNT OF CONTRACTS LET

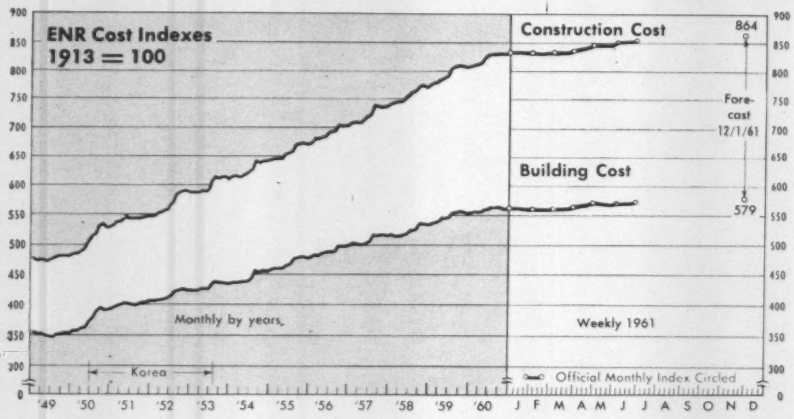
Contracts Awarded In 50 States	This Week#	Cum. 27 wks 1961	Chge '60-'61
By Type			
All Heavy Construction	$379.2	$11,309.1	− 3
By Ownership			
PRIVATE	158.5	5,638.8	− 8
PUBLIC	220.7	5,670.3	+ 3
State & Municipal	110.1	4,262.3	+ 4
Federal	110.6	1,408.0	+ 2
By Type of Work			
PUBLIC			
Waterworks	5.0	197.1	−20
Sewerage	9.4	379.4	+23
Bridges*	4.8	293.1	−29
Highways	41.8	1,876.1	+11
Earthwork, Dams & Waterways	28.0	475.8	+ 5
Buildings:			
Excl. Housing	66.1	1,361.0	+ 8
Housing	9.2	414.6	+29
Unclassified	56.3	673.1	−16
PRIVATE			
Buildings:			
Mass Housing	52.3	2,493.0	−17
Commercial	63.7	1,354.3	+10
Industrial	40.2	1,562.6	+13
Unclassified	2.4	229.0	−56

* Includes Private bridges † 4-day week
# 3-day week

NOTE: Minimum size projects included are: Waterworks and waterways, $53,000; other public works, $88,000; industrial buildings, $110,000; other buildings, $400,000.

NEW CONSTRUCTION CAPITAL

	Week of June 29 millions	Cum. 26 wks 1961	Chge '60-'61 %
Corporate Securities	$ 60.5	$1,899.0	+24
State and Municipal:			
All Except Housing	286.9	3,573.4	+0.1
Housing	0	31.3	−83
Federal Loans	3.1	166.7	+116
Federal Aid	0	0	−100
Total Nonfederal	$350.6	$5,670.4	−30
Federal Appropriations:			
Projects in U. S.	0	1.0	−99
Outside U. S.	0	0	−100
Total New Capital	$350.6	$5,671.4	−31


ENR Cost Indexes
1913 = 100
Construction Cost
Building Cost
864
579
Forecast 12/1/61
Monthly by years
Weekly 1961
Korea
Official Monthly Index Circled
'49 '50 '51 '52 '53 '54 '55 '56 '57 '58 '59 '60 J F M A M J J A S O N D

ENR INDEXES (1913 = 100), 20-cities' average	Week of June 29 1961	% Change from June 1 1961	% Change from July 7 1960
Construction Cost	853.64*	0.4	2.9
Building Cost	571.66*	0.3	1.6

*Official Monthly Index for July, 1961
To convert above indexes to 1926 = 100: Divide Construction Cost by 2.080; Building Cost by 1.850.
1949 = 100: Divide Construction Cost by 4.770; Building Cost by 3.518.

This Month . . .

WAGE RATES, 20-cities' average	July 1961	% Change from June 1961	% Change from July 1960
Common	$2.851	+0.5	+4.7
Skilled (average 3 trades)	4.215	+0.4	+4.1
Bricklayers	4.420	+0.3	+3.6
Structural Ironworkers	4.267	+0.4	+4.7
Carpenters	3.956	+0.6	+3.9
Equipment operators (average three types)	3.845	+0.6	+4.9
MATERIAL PRICES, 20-cities' average			
Structural Steel (average 3 mills), per cwt	5.50	0	0
Lumber, 2x4 Fir, per M fbm	118.13	+0.2	−1.1
Lumber, 2x4 Pine, per M fbm	109.60	+0.4	−1.1
Cement, bulk, per bbl	4.04	0	+0.7
Sand, per ton	2.355	+0.6	−4.6
Ready-mixed concrete, per cu yd	14.21	−0.2	−0.7
Gypsum sheathing, ½″x2′x8′, per Msf*	61.89	−0.7	−1.2
Fiber board sheathing, ½″ sq. ed., per Msf*	70.71	+0.07	−1.3
Mineral wool insulation, 3′ batts, per Msf*	66.92	−0.8	−1.5
Crushed stone, 1½″, per ton, CL	2.711	0	+1.6
Concrete blocks, sand/gravel, 8″x8″x16″, each*	0.2278	+0.7	−1.0

Latest Month . . .

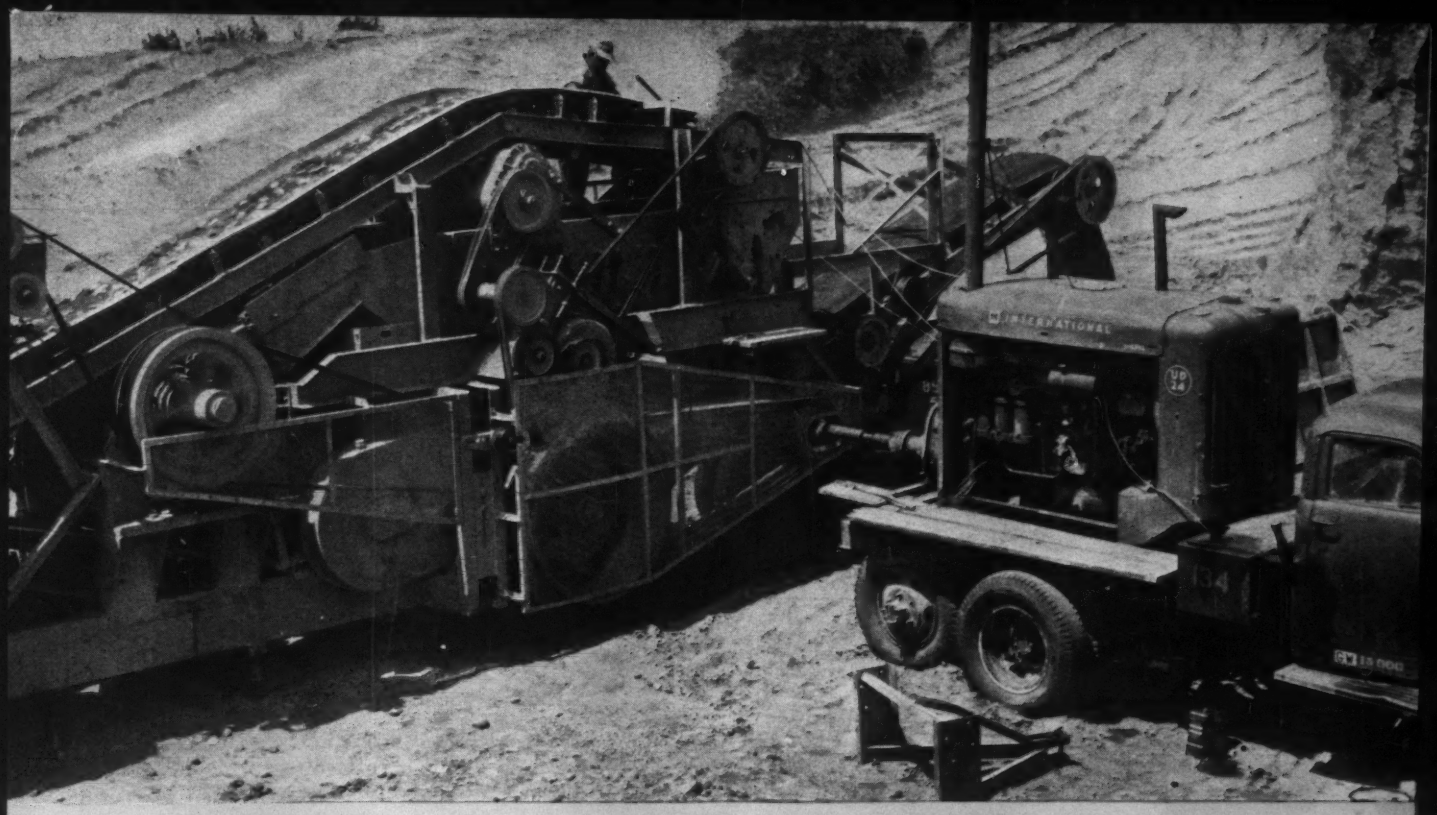
	June 1961	May 1961	June 1960
Brick, common per M	41.25	+0.2	+0.9
Lime, hydrated finishing, per ton, CL	39.68	−0.6	+0.9
Structural clay tile, 3x12x12″, per M, 2,000 up*	193.09	0	+2.6
Vitrified clay sewer pipe, std 12″, per ft	1.451	0	+1.1
Concrete sewer pipe, 12″, per ft	1.396	−1.8	−1.5

* Delivered, trucklots

ENR INDEX REVIEW

	Construction Cost		Building Cost		Volume	
1960	**1913 = 100**	**1949 = 100**	**1913 = 100**	**1949 = 100**	**1913 = 100**	**1949 = 100**
June	826.64	173.29	561.02	159.48	784	227
July	829.33	173.85	562.63	159.93	682	197
Aug	830.18	174.03	562.17	159.80	631	182
Sept	830.92	174.19	562.79	159.98	603	174
Oct	829.58	173.90	561.45	159.60	591	171
Nov	830.09	174.01	561.11	159.50	609	176
Dec	830.61	174.12	561.50	159.61	503	145
1960 Average	**823.55**	**172.64**	**559.43**	**159.02**	**597**	**172**
1961						
Jan	834.32	174.90	562.91	160.01	557	161
Feb	834.27	174.89	562.93	160.02	464	134
Mar	834.16	174.87	562.89	160.01	519	150
Apr	837.58*	175.59*	565.19*	160.66*	598*	173*
May	847.32*	177.62*	568.99*	161.74*	609*	176*
June	850.38*	178.28*	570.17*	162.07*	634*	183*
July	853.64*	178.95*	571.66*	162.50*	...	...

*Subject to adjustment due to retroactive wage increases.



"8 years . . . 12,000 hours . . . *never had the heads off!*"

International power assures aggregate supply for soil-cement experiment in Minnesota

Eight miles of experimental highway are being constructed on new grade as part of a soil-cement testing project near Fairmont, Minn. Resistance to wear and weather damage will indicate the best type of construction for subbase, with conventional bituminous paving on top. Values range from 2% to 9% of cement in the soil, and sections are built in 6- to 10-inch layers.

To insure peak aggregate production, W. Hodgman & Sons, Inc. of Fairmont, depends on International power. A TD-25 in the pit dozes gravel from different levels to obtain proper gradation, while a reliable International veteran powers the Cedar Rapids Commander crusher. This heavy-duty diesel engine has been in continuous service since 1953, running about 1,500 hours per year with very little time off for maintenance. Such records are typical of IH power, as thousands of contractors prove on construction jobs all over the country.

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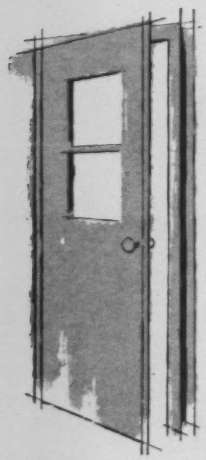
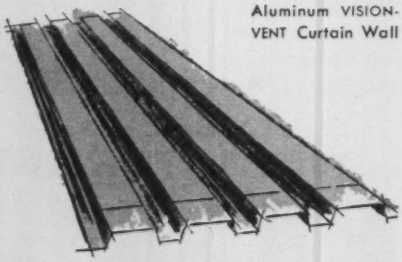


Truscon Maintenance-Free Metal Doors and Frames



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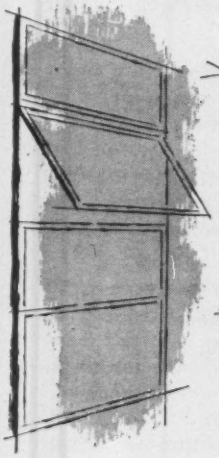

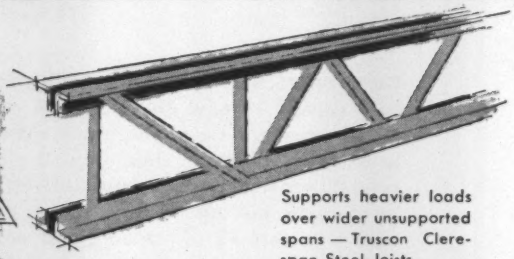

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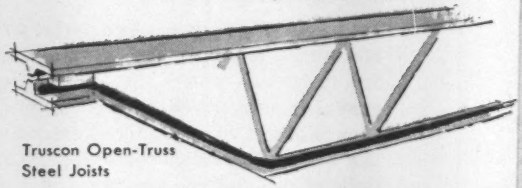
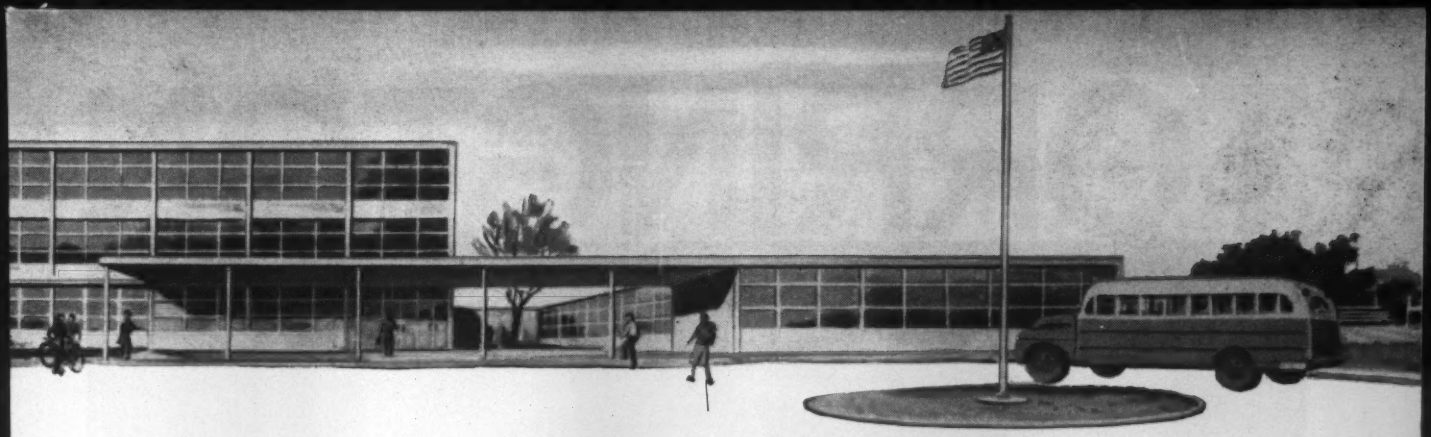


Truscon Open-Truss Steel Joists



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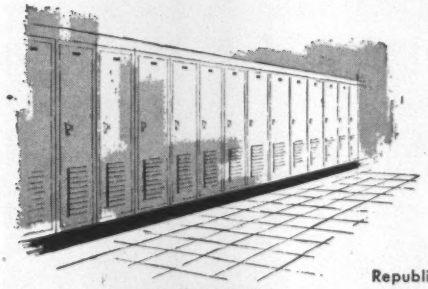
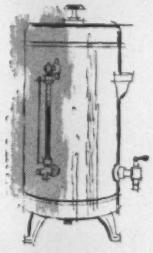


Republic Steel Lockers



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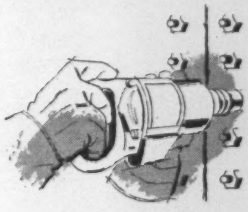

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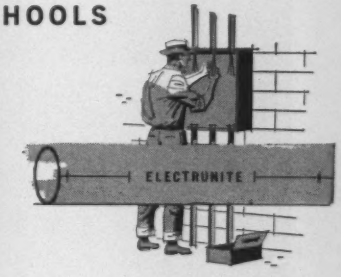

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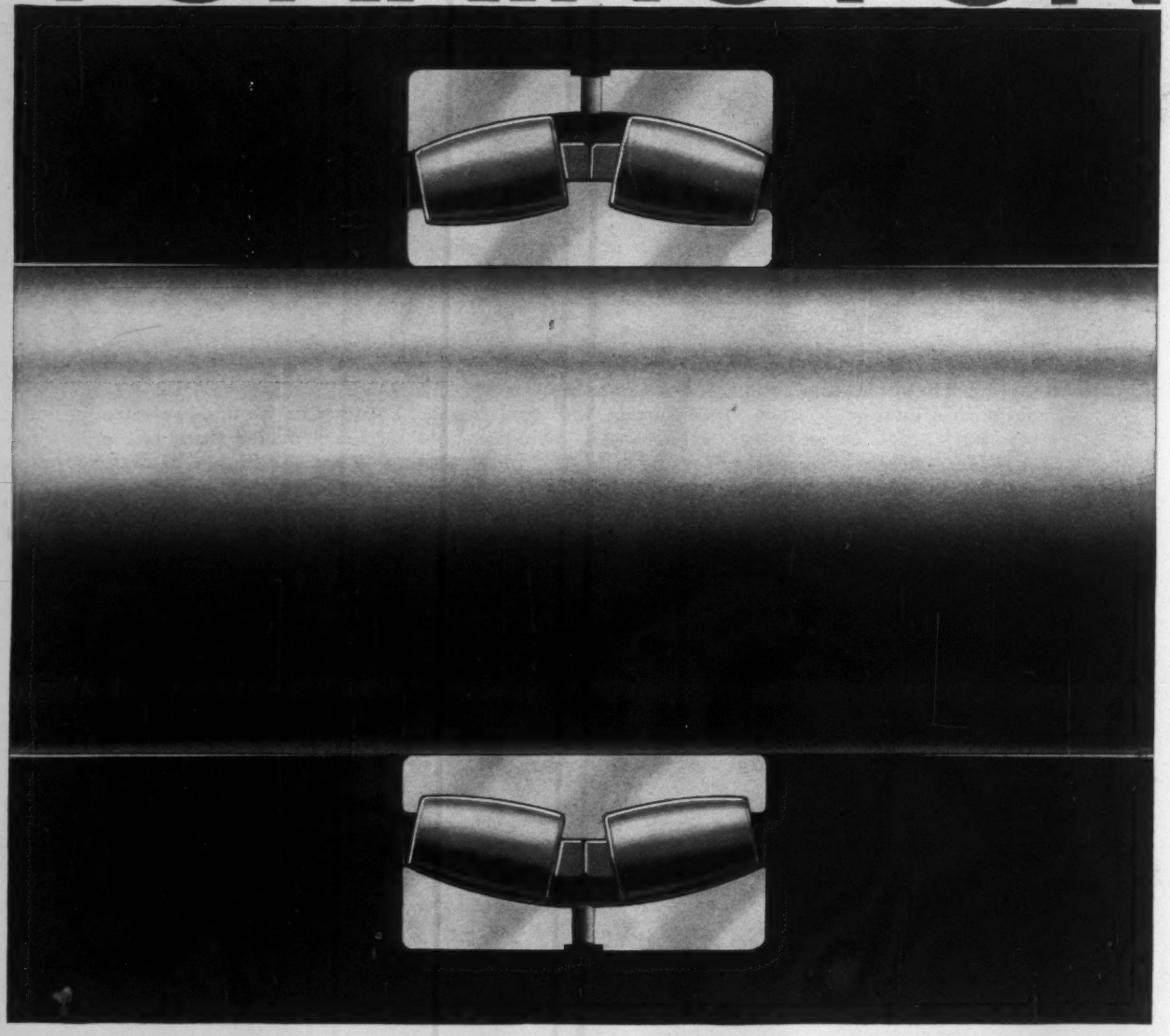

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Legislatures Vote Building Billions

Capital spending potential tops $2 billion in nine states, but voters in a tenth kill $60-million bond proposal

Lawmakers of nine states have wrapped up legislation that could lead to well over $2 billion worth of construction in the next two to four years. The states are: California, Colorado, Indiana, Kansas, Maine, Minnesota, New Jersey, Pennsylvania and Washington.

The legislature of a tenth state—Arkansas—approved a measure authorizing a referendum on a $60-million bond issue proposal to finance construction at state colleges and institutions. But last week the voters resoundingly rejected the proposal 135,739 to 68,988. A special legislative session now may be necessary this summer.

Of these states, California alone would account for $1.8 billion of the potential outlays. The total excludes the $1-billion Feather River water resources program also implemented by the just-adjourned legislature (see p. 25).

Included in the Golden State's $2.6-billion total budget is $150 million for construction at state colleges, University of California, prisons and hospitals.

The legislature also took the following actions:

- Authorized construction of a $65-million San Mateo-Hayward Bridge across San Francisco Bay.
- Approved expenditure of $500,000 for a study of a proposed crossing between San Francisco and Marin County via Angel Island or Alcatraz.
- Authorized the Los Angeles Metropolitan Transit Authority to use city streets and take other action necessary to move ahead with its $530-million rapid transit plan.
- Approved a constitutional amendment that would allow the sale of $100 million worth of general obligation bonds to finance construction of low-rent housing for persons over 60. The amendment is subject to approval of the voters in November 1962.
- Reduced from 67% to 60% the majority needed to pass a proposed $1-billion bond issue that would finance a San Francisco Bay area rapid transit system. This would probably accelerate a start on this project.

Maine's legislature appropriated $10 million for capital improvements in addition to providing financing for the state's $60-million highway construction program for the next two years. The total includes federal-aid funds.

Financing of the state's 1964-65 highway program got a start with authorization of a referendum on a $6-million highway bond issue.

Also authorized was a referendum on a $2.6-million bond issue to finance construction of student housing at five state teachers' colleges.

The legislature also made state history by putting Maine's largest river—the Kennebec—into the pollution control program. Legislation established standards of water quality and set up a 15-year timetable for compliance by industry and local communities.

Another bill raised the limit on state grants to localities for waste treatment plants from 20% to 30% of cost.

Minnesota lawmakers made a first move to free the state of shackles that now prevent further construction of state buildings. The legislatures approved a constitutional amendment, subject to voter approval, that will lift the state's debt limit set at $250,000 since 1857 in the state's constitution. This limit had been ignored until last year when the state supreme court barred further construction of state buildings. State debt now stands at $211 million.

Coupled with the constitutional measure was another approving outlays of $31 million for state buildings, but actual spending must await ratification of the proposed amendment.

The Minnesota legislature also passed a measure allowing two or more communities to establish sanitation districts. The lawmakers ignored, however, another proposal that would have authorized a $100-million metropolitan sanitary district for the twin cities of St. Paul and Minneapolis.

In Arkansas, the governor did receive stand-by authority to sell $20 million worth of highway construction bonds, if the state highway commissioner finds that funds are necessary. Similar authority was granted in 1959, but never used.

Outlays of more than $106 million for colleges, institutions and various state departments were authorized by the Colorado legislature.

Washington's legislature approved the sale of $59 million worth of bonds for school and college construction. Of the amount, $50.8 million will provide matching funds for localities. The balance will be sold by the University of Washington for construction at its Seattle campus.

In Indiana, an $80-million port project may go ahead as a result of a measure creating a port commission with authority to sell bonds that will pay the state's share of costs. Federal funds will also be required.

The Kansas legislature accelerated the construction program at state colleges and universities by providing an additional $9.9 million.

The New Jersey legislature authorized a referendum on two bond issues. One proposes the sale of $40 million in bonds for construction of welfare institutions and hospitals, the other $60 million in bonds to purchase land for state parks and recreational areas. Both proposals will be on the November ballot.

In Pennsylvania, the legislature is expected to act on a measure expanding the borrowing power of the General State Authority by as much as $253.3 million. Present limit is now $622 million. The authority sells bonds to finance construction of state-aided colleges and universities and other state buildings.

Monthly Indexes Score Fourth Consecutive Record

Rising wages shove building and construction costs to record highs for the fourth consecutive month.

ENR's Construction Cost Index, based on 1913 as 100, jumps to 853.64. Responsible are new contracts giving building laborers a 12½-cents-an-hour raise in Cincinnati and a 10-cent hourly boost in Pittsburgh. Laborers on both building and heavy construction projects in New York City get a wage-fringe package boost of 10.8 cents Heavy construction laborers receive hourly increases of 5 cents in New Orleans under an existing agreement, and 10 cents in Cincinnati under a new pact.

The ENR 20-Cities Building Cost Index, also based on 1913 as 100, hits 571.66. The rise in this index results from increases under new agreements in various trades. (For more on wage boosts, see p. 83.)

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Wages: Neither Boom Nor Bust

New 1961 wage increases, now averaging 13.2 cents, are below last year's, but fringes take up the slack

"Personally, in January I never thought we would go over 10 cents. But we wound up giving quarter and 30-cent raises. Why? I can't put my finger on it. That's the way negotiations are in this industry. They catch us at a time when we can't afford to take a strike. And the unions in Washington, of course, haven't tried to dampen the demands of local unions."

The comment comes from a contractor representative who has worked hard to keep wage increases within reasonable limits. His experience pretty well reflects what has been going on in the rest of the nation.

The record shows that wage increases negotiated so far this year are, on the average, somewhat smaller than those chalked up during the first half of last year. Wage freezes have been more numerous. Long-term contracts, which assure some stability, are growing in number. And strikes have been a little less frequent.

On its face, the picture may look encouraging. But it is deceptive.

Fringe benefits are eating into what little slack there is in base pay increases. Current wage freezes in many instances merely mean marking time at wage rates that are relatively high anyhow. Long-term contracts are costing more money.

The over-all picture indicates that the construction industry is in a collective bargaining rut. The 1961 wage settlements recorded by ENR show:

- **The most popular wage increase is still 15 cents an hour.**
- **The average of 1961 wage boosts is 13.2 cents an hour.** (The average for the corresponding period last year was 14.6 cents.)
- **Fringe benefit increases will average 7.3 cents an hour this year.**

Net result is that bargaining during the first half of 1961 has added an average of 20.5 cents an hour to direct labor costs, effective this year.

Contractors and the public have got little in return—and most of their gains have been negative ones. In some bargaining situations, for example, contractors did bargain their way out of demands for tight union control over hiring, for rigid subcontractor clauses and for shorter workweeks. But this merely represents a holding action.

Employer gains on the positive side are almost as unimpressive. Among them are spotty progress toward area-wide wage standardization, a few concessions on overtime rates, some improvements in handling jurisdictional disputes and less than a handful of promises to seek the help of the new Joint Appeals Board in future, deadlocked labor disputes.

For some groups, however, long-term labor contracts have been the big achievement. This year, 79% of all the contracts reported to ENR will remain in effect for more than a year. The figure at this time last year was 74%.

Two-year contracts are still the most popular (see table) but they are losing ground to three-year settlements, which have jumped by 12% so far this year.

The result promises a higher frequency of long-term labor peace and longer periods of wage stability in more parts of the nation. But the cost is high. And the deferred pay boosts built into the contracts tend to put the industry on a bargaining merry-go-round and raise a very practical roadblock to any widespread wage freezes in future negotiations.

Contractors who took one-year contracts, for example, have signed for an average wage increase of 12 cents an hour. Those who settled on a long-term basis will be paying an average wage increase of 13.5 cents this year, 12.5 cents next year and 12.9 cents in 1963. The deferred increases—and these are not subject to wage reopeners—will serve as wage boost targets for unions that will be negotiating in the next two years.

There has been little attempt to hedge or soften the impact of wage boosts. Use of an escalator clause based on the Consumer Price Index has been reported in one contract only. And, reversing an earlier trend, payment of

The '61 Wage Picture

(first six months)

1. Base pay increases lower; long-term contracts expensive.

Length of contract	Average increase in 1961 (1st half)	1960 (1st half)	1959 (1st half)
One-year contract	12.0¢	14.0¢	13.4¢
Long-term contract			
First year	13.5¢	14.9¢	13.4¢
Second year	12.5¢	14.1¢	13.0¢
Third year	12.9¢	14.1¢	12.8¢

2. The use of long-term contracts is growing. Three-year pacts show big gain.

Distribution of reported settlements by contract duration

Contract term	1961 (1st half)	1960 (1st half)
1 year	21%	26%
2 years	40%	46%
3 years	37%	25%
4 and 5 years	2%	3%

3. The 15-cent increase has become more popular.

Amount of increase	% of all contracts 1961 (1st half)	1960 (1st half)
15¢	34%	30%
10¢	19%	20%
12½¢	8%	8%
20¢	6%	13%
25¢	4%	3%
All others	29%	26%

annual increases in installments is slipping.

So far this year, only 17% of the new contracts call for payment of an annual wage boost in two or more steps. The corresponding figures were 6.7% in 1959 and 20% in 1960. Where the installment method is used, the most popular increments are 10 cents and five cents.

The 15-cent figure seems to be firmly entrenched as the most popular annual settlement figure. The frequency of its use has advanced by 4% to 34% this year. The 10-cent figure trails far behind, but it still is common use.

The size of annual pay boosts, however, continues to range far and wide. While teamsters in Washington, D.C., for example, will get two 2½-cent increases in 1961, bricklayers in Ames, Iowa, will get 35 cents this year in installments of 25 cents and 10 cents, plus another 15 cents next year. And in New Jersey one bricklayers local is slated for 75 cents more in wages in steps of 20 cents, 10 cents, 25 cents and 20 cents over a three-year period.

In 27 new contracts, unions froze their wages—and their fringes—for 1961. This is a big increase over the handful reported at this time last year.

Some of the freezes occurred in one-year contracts. But, marking a new development, 12 of them appeared in the first year of long-term pacts. In the latter, either deferred increases are provided for in the second and third years, or the situation is covered by reopener clauses. The reason invariably given for the freezes is to help stimulate business and employment.

The fact that many participating local unions are already in the high pay brackets takes some of the edge off the freezes. The average wage scale of all workers who won pay boosts in the new contracts recorded by ENR, for example, is $3.66 after the 1961 increases are added. The average wage scale of the unions that have frozen their wages for 1961 is only 5 cents less—$3.61.

A strong interest in fringe benefits has helped pull down the mid-year average of 1961 wage increases. A significant number of contracts provide for little or no wage increase but make up the difference in fringe benefits. These contracts were included in computing the average base pay increase of 13.2 cents, although contracts that froze both wages and fringes were excluded. Had the small wage-big fringe contracts also been excluded, the ENR average wage increase would have been 14 cents.

Health and welfare benefits came in for the most attention. Pension plans came next, with vacation plans and industry promotion trailing behind. These conclusions are based on the frequency of negotiation and not on the size of the amounts negotiated.

Moneywise, the older, established benefits made the poorest showing. The average of the amounts negotiated for new or improved vacation benefits, effective this year, was 11.2 cents. Pension amounts averaged 10.4 cents and health and welfare benefits 5.7 cents.

Strikes were down about 1%. A little more than 14% of the January-June settlements were preceded by strikes that ranged in duration from one day to nine weeks. In this respect, the construction industry has followed a national 1961 pattern of lower strike incidence.

The Joint Appeals Board, which is the industry's newest machinery for settling disputes without strikes, has received little response. The board is available to any of the seven basic trades and to the contractors that hire them whenever local bargaining or settlement machinery breaks down if both sides consent to its use.

JAB was not used in any of the reported strikes that have occurred since the board's formation. And provision for use of JAB in future disputes has been written into only two reported contracts—both with the teamsters.

In explaining why JAB hasn't made much more of an impression at the local level than the "Ten Commandments" work practices code did, contractors and unions have offered two reasons:

- The board is still unknown and misunderstood. People in one area, for example, think it applies only to missile base disputes.
- Local contractors and unions don't want interference from the outside. Said one contractor: "We want no part of a national joint board which will come in and tell us what we ought to pay our employees."

Labor in Brief . . .

- **Court rejects contributions**—Dealing another blow to negotiated industry promotion funds, a federal court ruled that employer payments to the lath-and-plaster-promoting Southern California Plastering Institute violate the Taft-Hartley Act.

- **A separate voice**—AFL-CIO industrial unions in Texas may form a statewide Industrial Union Council. Union leaders deny that merger with the building trades has reached the breaking point but see some merit in having a counterpart to the State Building Trades Council.

- **Benefits increased**—Hawaii has raised its maximum unemployment benefits to $55 a week. To qualify for the maximum, an applicant must earn $1,350 in the quarter during which his earnings were highest. Amount of taxable wages is $3,600.

- **Housing jobs struck**—A strike to end "labor abuses" and to force recognition of union wages and conditions has halted hundreds of Toronto, Ont., housing projects on which many immigrants are working.

- **A concession to labor?**—Do you have to be a union contractor to be awarded a state contract in Kentucky? The question is being answered both ways. Gov. Bert Combs, who is in the middle, intends "to formulate a policy" that will protect the taxpayers and be "fair."

- **Right-to-work**—A right-to-work bill banning the union shop has been killed in Vermont. Oklahoma has shelved a resolution calling for a statewide vote on a similar proposal. And efforts to impose criminal penalties for right-to-work violations in Florida have been defeated.

- **Jobless with "good cause"**—Union workers idled by compulsory retirement provisions of a negotiated pension plan may not be denied unemployment benefits in California, according to the California Unemployment Insurance Appeals Board.

- **Prefabrication**—A federal court has issued a temporary injunction against the Ohio Valley Council of Carpenters in a dispute over use of prefabricated material on a Cincinnati job. A labor board official said carpenters insisted a prefabricated tool shed be disassembled and put together again.

- **Contractor has an answer**—A Sault Ste. Marie, Ont., apartment project contractor, hiring local and out-of-town nonunion workers who are jacks of all trades, says "unionists are slow workers" and he can't afford to call specialists for particular jobs.

OFFICIAL PROPOSALS

RATE: The rate for Official Proposal advertising is $2.70 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.

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SEND COPY TO: Official Proposal Division, Engineering News-Record Class. Adv. Div., P. O. Box 12, N. Y. 36, N. Y.

Bids: July 27, 1961

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.,—Pursuant to the provisions of the Highway Law, and Canal Law, Article 2, Title 9 of the Public Authorities Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time which is nine-thirty o'clock A.M., eastern standard time, on the 27th day of July 1961, by Henry A. Cohen, Director, Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Types	Deposit	Estimated Cost of Work
DISTRICT No. 1, F. J. Fuller, District Engineer, 353 Broadway, Albany 1, New York						
Albany (Int. Trg. Rte. 787)	FIC 61-16	Interstate Rte. Conn, 540. Rte. 9W to Green Street (City of Albany) Project I-787-3(43)	....	Extension of Storm Sewer	$21,000 Plans $5	$364,000
Albany Rensselaer	TCB 61-1	Repairing the 112th St. Br. & Approaches Between the Cities of Troy and Cohoes	0.22	Asphalt Conc.=0.16 Mi.; Open Steel Floor=0.04 Mi.; Misc. Work=0.02 Mi.; Repairs to 5 Span Br: Reinf. Conc. Arch Sps. 2 @ 121.5'; 2 @ 168' and Steel D.L. Bascule Ctr. Span @ 224'	$20,000 Plans $5	349,000
Essex (Rte. 9, 22)	D.A. 61-2	State Highways 8314, 8238, 232, 859, 8128, 1641, 1687 Proj. RAD 13(5) Cont. 1	25.0±	Tree Trimming	$800 Plans $5	15,000
Essex	D.A. 61-6	Defense Access: Bypass of D&H Railroad Overhead Crossing. Proj. RAD 13(1)	0.29	Asphalt Concrete	$1,500 Plans $5	26,000
Rensselaer (Rte. 22, 43)	FARC 61-104	Stephentown-Lebanon Springs, S.H. 8279; Stephentown Ctr.-Mass. S.H. 680; Stephentown-Center Berlin S.H. 8163. Proj. F-440(3); F-257(5)	11.76	Asphalt Conc.=11.56 Mi. Misc. Work=0.20 Mi.	$159,000 Plans $5	2,898,000
Saratoga (Rte. 32)	FARC 61-60	Stillwater-Schuylerville, Pt. 1, S.H. 5205: Stillwater-Schuylerville, Pt. 2, S.H. 5230 Proj. S-393(1)	2.60	Asphalt Concrete	$16,000 Plans $5	307,000
DISTRICT No. 2, L. Ketchum, District Engineer, 109 No. Genesee Street, Utica 1, New York						
Fulton (Rte. 10, 29)	R.C. 61-124	Schoolhouse-Lassellsville, Pt. 1, S.H. 5554; Rockwood-Fullers Cors. S.H. 8400; Caroga Creek-Canada Lake, S.H. 9039	5.78	Asphalt Concrete, Type 1A	$13,000 Plans $5	229,000
DISTRICT No. 3, E. E. Towlson, District Engineer, 333 E. Washington Street, Syracuse, New York						
Cortland (Rte. 13)	FARC 61-9	Dryden, S.H. 215; Dryden-Cortland, Pt. 2, S.H. 535 Proj. F.U.-513(6)	4.36	Asphalt Concrete, Type 1A	$50,000 Plans $5	898,000
DISTRICT No. 4, B. F. Perry, District Engineer, Barge Canal Terminal, Rochester 1, New York						
Genesee (Rte. 77)	R.C. 61-114	Indian Falls Corfu, Pt. 2, S.H. 922; Corfu-Indian Falls, Pt. 2 & Indian Falls-Alabama, S.H. 8245 & Corfu-Indian Falls, Pt. 2, S.H. 1753	7.60 (0.06 Acc.)	Asphalt Concrete	$34,000 Plans $5	603,000
Livingston (Rte. 15)	FARC 61-115	Lakeville-East Avon, S.H. 8034 Proj. F-61(4)	3.86	Asphalt Concrete=3.82 Mi. Misc. Work=0.04 Mi.	$26,000 Plans $5	479,000
Livingston (Rte. 256)	R.C. 61-113	Scottsburg-Upper Lakeville, Pt. 2, S.H. 8397	8.54	Asphalt Concrete	$25,000 Plans $5	450,000
Monroe	LOSPTL 61-3	Lake Ontario State Parkway (Dewey Ave.-Rochester, City Line)	1.66	Electrical Lighting Facilities	$9,500 Plans $5	170,000
Monroe	M 61-10	East Guard Lock Near the City of Rochester	0.20	Repairs to lock and Canal Walls	$9,000 Plans $5	160,000
DISTRICT No. 5, E. G. H. Youngmann, District Engineer, State Office Bldg., 65 Court Street, Buffalo 2, New York						
Cattaraugus (Rte. 242)	R.C. 61-118	Ellicottville-Machias, Pt. 2, S.H. 8416	9.58	Asphalt Concrete	$45,000 Plans $5	822,000
Chautauqua (Rte. 17J)	FARC 61-116	Lakewood-Chautauqua, S.H. 9028 Proj. S-557(2)	0.62	Asphalt Conc.=0.57 Mi; Misc. Work=0.05 Mi.; Prestress. Conc. Beam Bridge 72' Sp.	$14,000 Plans $5	255,000
Chautauqua (Rte. 74)	R.C. 61-117	Cutting-Clymer, S.H. 8278 Clymer-Panama, S.H. 8208	8.86 (0.02 Acc.)	Asphalt Conc.=8.81 Mi. Misc. Work=0.07 Mi.	$54,000 Plans $5	985,000
Erie & Niagara	TAN 61-9	New York State Thruway: Niagara Section, Subdivisions N-8-S and N-8-N	....	Rehabilitation of Electrical Facilities on Grand Island Bridges and Approaches	$13,000 Plans $10	242,000
Niagara (Rte. 93)	FARC 61-84	Lockport-Tonawanda Creek, S.H. 749 Project S-685(4)	9.61	Asphalt Concrete	$39,000 Plans $5	717,000
DISTRICT No. 6, Wm. J. Dennis, District Engineer, State Office Bldg., 30 West Main Street, Hornell, New York						
Steuben (Rte. 70)	FARC 61-106 RC 61-107	Big Creek, Pts. 1 & 2, S.H. 906 Big Creek, Pts. 1 & 2, S.H. 906 Proj. F-867(6)	2.09	Asphalt Concrete	$7,000 Plans $5	115,000
DISTRICT No. 7, R. W. Sweet, District Engineer, 444 Van Duzee Street, Watertown, New York						
Clinton & Franklin	D.A. 61-5	Various State, County & Town Highways in District 7 (Cont. #2). Proj. RAD-13(5)	165.0±	Tree Trimming	$1,800 Plans $5	32,000
Franklin (Rte. 11)	R.C. 61-127	Malone-Chateaugay, S.H. 5613	4.58	Asphalt Concrete Ty. 1A	$13,000 Plans $5	233,000
Jefferson (Rte. 11)	FARC 61-122	Adams-Watertown, Pt. 3, S.H. 5119 Adams-Watertown, Pt. 4, S.H. 5426 Proj. F-327(12)	2.09	Asphalt Conc., Type 1A	$12,000 Plans $5	224,000
Jefferson (Rte. 178)	FARC 61-95	Adams Vill: So. Main St. & Pierrepont Manor Hamlet: Ellisburg St., S.H. 1166, State Road, Pt. 2, S.H. 426 Proj. S-586(1)	0.80	Asphalt Conc. Type 1A=0.70 Mi.; Misc. Work=0.10 Mi.; Comp. I-Beam Br. 3 Sps. @ 229.9' Tot.	$15,000 Plans $5	280,000
Jefferson	MA 61-2	Maintenance Area for Interstate Rte. 505 (at Intersection with N. Y. State Rte. 12)	....	Foundation Crse. and Chain Link Fencing	$3,500 Plans $5	63,000
St. Lawrence (Rte. 37)	FARC 61-105	Vill. of Massena Ctr. St.-Parker St., FASSH 57-5: Massena So. Side Rte. Pt. 2, FASH 55-7; Massena-Helena, Pt. 1, S.H. 1261 Proj. US-467(4),; U-580(17)	5.13	Alum. Chain Link Fenc.: 6' High, Row Fencing; 4' High, Resetting; Chain Link Fenc, 6' high	$2,500 Plans $5	45,000
DISTRICT No. 8, M. N. Sinacori, District Engineer, Pleasant Valley Rd., Poughkeepise, New York						
Columbia	FASS 61-4	Canaan Ctr.-Austerlitz Town Line, C.R. 79 Proj. S-7(2)	2.36	Calcium Chloride Treat. Gravel	$18,000 Plans $5	322,000
Columbia	FASS 61-3	Manorton-Blue Stores, CR 44 Proj. S-234(4)	1.38	Stabilized Gravel Surf. Crse. Calc. Chloride Treatment	$11,000 Plans $5	194,000
Dutchess	FASS 61-2	Stanfordville-Bullshead-Wurtemburg Rd. C.R. 19 Proj. S-342(2)	4.87	Asphalt Concrete Reinf. Conc. Open Box Br. 23.09' Sp. Rein. Conc. Closed Box Br. 33' Sp.	$45,000 Plans $5	823,000
Rockland	FASS 61-5	New City-Congers Rd. County Road (Main Street to Brewery Rd.) Proj. S-311(3)	0.72	Asphalt Concrete	$19,000 Plans $5	332,000
Ulster (Rte. 55)	FARC 61-126	Napanoch-Montela, S.H. 603 Proj. F-487(3)	5.19	Asphalt Concrete	$13,000 Plans $5	235,000

(Continued on the following page)

OFFICIAL PROPOSALS

(Continued from preceding page)

DISTRICT No. 9, J. C. FEDERICK, District Engineer, 71 Frederick Street, Binghamton, New York

Delaware (Rte. 28)	R.C. 61-109	Delhi-Andes, S.H. 982	6.88	Asphalt Concrete	$24,000 Plans $5	437,000
Otsego (Rte. 80)	R.C. 61-119	New Berlin-Edmeston, S.H. 8143	4.60	Asphalt Concrete	$14,000 Plans $5	249,000
Schoharie (Rte. 10)	R.C. 61-110	Cobleskill-Sharon Springs, Pt. 3, S.H. 1911	6.25	Asphalt Concrete	$17,000 Plans $5	310,000
Sullivan (Rte. 42)	R.C. 61-111	Forestburg-Orange Co. Line, S.H. 1478	4.01	Asphalt Conc.	$10,000 Plans $5	183,000
Sullivan (Rte. 17)	R.C. 61-112	Bloomingburg-Monticell, Pt. 2, S.H. 5457; Bloomingburg-Monticello, Pt. 1, S.H. 5510	6.75	Asphalt Conc, Type 1AC	$8,000 Plans $5	153,000

DISTRICT No. 10, A. M. SARR, District Engineer, 325 W. Main Street, Babylon, L. I., New York

Nassau, Suffolk (Rtes. 106, & 25)	FARC 61-125	Newbridge Road, S.H. 546; Jericho Turnpike, Pt. 2, S.H. 5111; Mattituck-Greenport, Pts. 1 & 3, S.H. 8229; Smithtown Branch-Coram, S.H. 8268 Proj. S-505(1), F-1000(9), and F-434(4)	1.55	Miscellaneous Drainage	$31,000 Plans $5	565,000
New York	FAHRD 61-1	Harlem River Drive (East 132nd St. to West 143rd St.) Contract 132B Proj. U-1133(8)	0.65 (0.93 Acc.)	9" Cem. Conc. Pavt. with Carbon Black=0.65 Mi.; Asph. Conc. Pavt.=0.93 Mi.; Comp. Struct. 5 Spans (Var.) 310' Tot.; Comp. Struct. 10 Sps. (Var.) 553' Tot.; Ped. Overpass—Steel and Conc. Struct. 7 Sps. (Var.) 580' Tot.	$150,000 Plans $5	2,803,000
Suffolk	FALIE 61-3	Long Island Expressway, Contract No. 12 (Commack Road to Islip Avenue) Proj. U-862(32)	3.80 (8.62 Acc.)	9" Cem. Conc. Pavt. with Carb. Black, 2@ 24' Var.= 3.45 Mi.; Misc. Work=0.35 Mi.; Access=3.34 Mi. Cem. Conc. Pavt. and 5.28 Mi. Asph. Conc., 8 H.G.S. Comp. I-Beam, 1 Sp. 83.6'; 1 Sp. 84.2'; 4 Sps. 286.4' Tot.; 4 Sps. 279.1' Tot; 4 Sps. 286.7' Tot.; 1 Sp. 72.1'; 1 Sp. 72.1'; 4 Sps. 231.5' Tot.	$375,000 Plans $10	6,811,000

Any projects in this letting that are on the Federal Aid highway systems are subject to the provisions of the "Federal Aid Highway Act of 1956", being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wage), Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal.

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

If the deposit is $10.00 or more, full refund for one copy of the plans and specifications will be made to a bidder for the particular project, if such plans and specifications are returned in good condition within 30 days after the award of the contract or after the rejection of the proposal. The successful bidder is not required to return the copy of the plans and specifications in order to be entitled to such refund. If the deposit is $10.00 or more, partial refund will be made for the return of all other copies of plans and specifications in good condition within 30 days after the award of the contract or the rejection of the proposal.

Special attention of bidders is called to "Information for Bidders" in the Public Works Specifications, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as Amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Department of Public Works" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bid deposit, the execution of the contract and bond shall conform to the provisions of the Highway Law, as set forth in the "Information for Bidders".

The right is reserved to reject any or all bids.

J. BURCH McMORRAN
SUPT. OF PUBLIC WORKS

Bids: July 13, 1961

New York State Road Work
Harlem River Drive

NOTICE TO CONTRACTORS

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Highway Law, sealed proposals will be received until 10:30 a.m., Advanced Eastern Standard Time, on July 13, 1961, by Henry A. Cohen, Director, Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for:

SOIL EXPLORATIONS AND FOUNDATION INVESTIGATIONS AT VARIOUS SITES ON HARLEM RIVER DRIVE, 155TH STREET TO HARLEM RIVER DRIVEWAY, NEW YORK COUNTY, WHICH CONSTITUTES CONTRACT SPEC. NO. SM-184.

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, New York.
(b) Mr. Austin M. Sarr, District Engineer, New York State Department of Public Works, 325 West Main Street, Babylon, Long Island, New York.
(c) Mr. William Mende, Principal Building Construction Engineer, Department of Public Works, 270 Broadway, New York City.

The deposit for a set of plans, specifications and proposal forms is $5.00. Refunds of deposits for plans, specifications and proposals will be made *only* in case the deposits of individual sets are $10.00 or more, per Chapter 835, Laws of 1960.

The Engineer's Estimate of cost for this work is $36,800.00.

Proposal for this contract must be submitted in separate sealed envelope with the name of the contract plainly endorsed on the outside of the envelope. Proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Department of Public Works" for the sum of $1,000.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law as set forth in "Instruction to Bidders".

The right is reserved to reject any or all bids.

J. BURCH McMORRAN
SUPERINTENDENT OF
PUBLIC WORKS

Bids: July 20, 1961

New York State Road Work
Willowbrook Expressway

NOTICE TO CONTRACTORS

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Highway Law, sealed proposals will be received until 10:30 a.m., Advanced Eastern Standard Time, on July 20, 1961, by Henry A. Cohen, Director, Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for:

SOIL EXPLORATIONS AND FOUNDATION INVESTIGATIONS AT VARIOUS SITES ON WILLOWBROOK EXPRESSWAY, CLOVE LAKES EXPRESSWAY TO BAYONNE BRIDGE, RICHMOND COUNTY, WHICH CONSTITUTES CONTRACT SPEC. NO. SM-185.

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, New York.
(b) Mr. Austin M. Sarr, District Engineer, New York State Department of Public Works, 325 West Main Street, Babylon, Long Island, New York.
(c) Mr. William Mende, Principal Building Construction Engineer, Department of Public Works, 270 Broadway, New York City.

The deposit for a set of plans, specifications and proposal forms is $5.00. Refunds of deposits for plans, specifications and proposals will be made *only* in case the deposits of individual sets are $10.00 or more, per Chapter 835, Laws of 1960.

The Engineer's Estimate of cost for this work is $31,300.00.

Proposal for this contract must be submitted in separate sealed envelope with the name of the contract plainly endorsed on the outside of the envelope. Proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Department of Public Works" for the sum of $1,750.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law as set forth in "Instruction to Bidders."

The right is reserved to reject any or all bids.

J. BURCH McMORRAN
SUPERINTENDENT OF
PUBLIC WORKS

Bids: July 18, 1961

Power Authority of
the State of New York
Niagara Power Project

ADVERTISEMENT FOR PROPOSALS
FOR
GRADING, TOPSOILING AND SEEDING WATERWAYS, WORK SECTION III FROM STATION 202+00 TO STATION 226+70 IN LEWISTON AND NIAGARA, NIAGARA COUNTY, NEW YORK
SPECIFICATION NO. PA-N-23050
NIAGARA CONTRACT N 41

NOTICE TO CONTRACTORS: The Power Authority of the State of New York will receive sealed proposals for grading, topsoiling and seeding, Work Section III, from Station 202+00 to Station 226+70, in Lewiston and Niagara, Niagara County, New York, until 10:30 A.M., Eastern Daylight Saving Time on the 18th day of July, 1961, at the Authority's Office, 18th Floor, The Coliseum Tower, 10 Columbus Circle, New York 19, New York, at which time and place the proposals will be publicly opened and read aloud.

The principal items of work are:
Estimated:

74 Acres	Grading
1,800 Sq. Yards	Sodding
55.6 Acres	Topsoiling, 4" thick
16.4 Acres	Topsoiling, 6" thick
72 Acres	Preparation of seed bed, applying ground limestone, seed, mulch and maintenance

All work shall be completed on or before December 1, 1962 including maintenance.

Plans, specifications and proposal forms for the work may be obtained from the Power Authority of the State of New York, 18th Floor, The Coliseum Tower, 10 Columbus Circle, New York 19, New York, upon application and prepayment of a fee of Ten Dollars ($10.00) per initial set of contract documents, and Five Dollars ($5.00) per set for additional sets, no part of which will be refunded. Plans, specifications and proposal forms for the work will be on file in the Authority's office and in the offices of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, and may be inspected by prospective bidders during office hours.

Bids must be made and returned in duplicate in accordance with instructions contained in the Information for Bidders. Guarantee will be required with each bid

(Continued on opposite page)

OFFICIAL PROPOSALS

(Continued from opposite page)
in an amount not less than 20 percent of the total of the gross sum bid.

The right is reserved to reject any or all bids.

W. S. CHAPIN
GENERAL MANAGER

PA-N-23050

Bids: September 1, 1961

Government of Hong Kong Plover Cove and Hebe Haven Water Scheme

It is hereby notified that sealed tenders in duplicate are invited for the Construction of Tunnels, etc. between Tai Po Tau and Pai Tau Hang (P.W.D. Contract No. 101 of 1961), comprising approximately 8 miles of tunnelling up to 22 ft. diameter, shafts and stream intakes.

Tenders must be delivered to the Secretary of the Tender Board, Colonial Secretariat, Central Government Offices, Lower Albert Road, Hong Kong not later than 12 noon on Friday, 1st September 1961. The package, if sent by post, must be registered and if delivered by hand must be placed in the Tender Box situated in the lift lobby on the 6th Floor of the Central Government Offices (Main Wing) at the above address.

Forms of Tender, Specification and further particulars may be obtained from the offices of the Consulting Engineers for the Plover Cove and Hebe Haven Scheme in Hing Kong or London on deposit of a cheque for H.K.$400 or £25 refundable on receipt of a bona fide tender.

Contractors registered in Hong Kong and on the Public Works Department list of approved contractors (only Group V permitted to tender) need not pay the above deposit but will be liable to have their names removed from the list of approved contractors if they fail or refuse to implement an accepted tender or having obtained forms of tender fail to submit a bona fide tender.

The Government does not bind itself to accept the lowest or any tender.

Consulting Engineers:—

Binnie, Deacon & Gourley, Artillery House, Artillery Row, Westminster, London, S.W.1.

Scott & Wilson, Kirkpatrick & Partners, Manson House, Nathan Road, Hong Kong.

Bids: July 27, 1961

New York State Road Work Oronge & Dutchess Counties

NOTICE TO CONTRACTORS: THE NEW YORK STATE BRIDGE AUTHORITY, BRIDGE PLAZA, POUGHKEEPSIE, N. Y. Pursuant to the provisions of the Highway Law, and Article 3, Title 2 of the Public Authorities Law, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nine-thirty o'clock A.M., eastern standard time, on the 27th day of July 1961, by Henry A. Cohen, Director, Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., on behalf of said Authority, for the following project:

ORANGE & DUTCHESS COUNTIES
KURT G. RAUER, DISTRICT ENGINEER, PLEASANT VALLEY ROAD, POUGHKEEPSIE, NEW YORK

NAME OF PROJECT & MILES—Newburgh-Beacon Bridge over the Hudson River (Cont. 3) Superstructure 14 SPS. 6870' Total. 1.30 Miles.

DEPOSIT FOR PLANS—$5.00.

BID DEPOSIT—$600,000.

ENGINEER'S EST.—$10,725,000.

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts, Albany, New York, and at the office of the District Engineer, noted above, and at the office of the State Department of Public Works, 270 Broadway, New York City, and may also be seen at the New York State Bridge Authority Office at Mid Hudson Bridge Plaza, Poughkeepsie, N. Y.

If the deposit is $10.00 or more, full refund for one copy of the plans and specifications will be made to a bidder for the particular project, if such plans and specifications are returned to the Bureau of Contracts in good condition within 30 days after the award of the contract or after the rejection of the proposal. The successful bidder is not required to return the copy of the plans and specifications in order to be entitled to such refund. If the deposit is $10.00 or more, partial refund will be made for the return of all other copies of plans and specifications in good condition within 30 days after the award of the contract or the rejection of the proposal.

OFFICIAL PROPOSALS

Special attention of bidders is called to "Information for Bidders" in the Public Works Specifications.

Proposal must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the NEW YORK STATE BRIDGE AUTHORITY for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bond shall conform to the provisions of the Highway Laws, and Public Authorities Law, as set forth in "Information for Bidders".

The right is reserved to reject any or all bids.

J. BURCH McMORRAN
SUPT. OF PUBLIC WORKS
FOR
NEW YORK STATE BRIDGE AUTHORITY
DR. JOHN L. EDWARDS
CHAIRMAN

Bids: July 27, 1961

The Port of New York Authority Holland Tunnel

FIRE DOORS AND MASONRY WALLS
CONTRACT O & M 630

Sealed proposals for the installation of fire doors and masonry walls at the roadway level of the Holland Tunnel will be received at the office of the Department of Purchase and Administrative Services of The Port of New York Authority, Room 900, 111 Eighth Avenue, New York 11, New York, until 11:00 A.M. o'clock Thursday, July 27, 1961, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Department of Purchase and Administrative Services, Room 900, and copies will be furnished upon deposit of $10.00 per set. Deposit must be delivered to Treasury Department, Room 1001, where a receipt will be issued. The receipt is then to be delivered to the Department of Purchase and Administrative Services, who will furnish the contract documents. The deposit will be remitted if the documents are returned in good condition, not later than thirty days after the opening of Proposals. The deposit will be forfeited if the documents are not returned within thirty days.

THE PORT OF NEW YORK AUTHORITY
S. Sloan Colt, Chairman

New York, July 6, 1961

Bids: July 20, 1961

The Port of New York Authority

Sealed proposals for the following work will be received at the Office of the Chief Engineer, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on date indicated, at which time said proposals will be opened and read in Room 1108.

Contract LGA-270.016—La Guardia Airpot—Reconstruction of Dike—Deposit $30.00 per set of documents—Bids will be received until 2:30 P.M. on Thursday, July 20, 1961.

Contract documents may be seen at the Office of the Assistant Chief Engineer for Design, Room 1115, 111 Eighth Avenue, New York 11, N. Y. Documents will be furnished upon receipt of the above deposit (each set including one copy of the Contract Drawings) for not more than three sets to any one company. Additional sets will be furnished upon payment of an amount for each set equal to the deposit indicated above, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract directly to the Authority will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid, will receive a refund of one-half of the deposit for each set of documents, not exceeding three returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
S. Sloan Colt, Chairman

New York, July 6, 1961

READ THE OFFICIAL PROPOSAL COLUMN OF ENGINEERING NEWS-RECORD THIS WEEK AND EVERY WEEK

OFFICIAL PROPOSALS

District of Columbia—Sewer Construction—Dept. of Sanitary Engineering, Office of the Potomac Interceptor, June 27, 1961. UNIT #2, THE BROAD RUN TUNNEL OF THE POTOMAC INTERCEPTOR SEWER, near Sterling in Loudoun County, Virginia (Invitation No. C-61149-S), consisting of the following: SEWER CONSTRUCTION: 10,800 lin. ft. of 66" I.d. concrete sewer in tunnel (of which 2,700 lin. ft. may be open cut construction at contractor's option); 200 lin. ft. of 54" I.d. concrete pipe in open cut construction; plus access shafts and vent structures. (Wage rates have been predetermined by Labor Dept.) Bid forms, plans and specifications are now available from Supervisor, Bid & Contract Division, Procurement Office, D. C., Room 404, 499 Penn. Ave., N.W., upon deposit of a certified check for $50.00 per set, payable to D. C. Treasurer (Phone NA 8-6000, Ext. 448). SEALED BIDS to be opened 3:00 PM, EDT, July 18, 1961, in Room 424, 499 Penn. Ave., N.W.

District of Columbia—Bridge Construction—Dept. of Highways & Traffic, D. C., June 21, 1961. CONSTRUCTING THE RIVER CROSSING SUPERSTRUCTURE FOR THE THEODORE ROOSEVELT BRIDGE, FEDERAL-AID INTERSTATE PROJECT NO. I-66-1(14)0, Contract No. 3, Invitation No. C-621-H, consisting of approx. 4,128 cu. yds. Air-Entrained Superstructure Concrete; 962,500 lbs. Reinforcing Steel; and 9,474,000 lbs. Structural Metalwork. (Wage rates have been predetermined by Labor Dept.) Bid forms, plans and specifications are now available from Supervisor, Bid & Contract Division, Procurement Office, D. C., Room 404, 499 Penn. Ave., N.W., upon deposit of a certified check for $50.00 per set, payable to D. C. Treasurer (Phone NA 8-6000, Ext. 448). SEALED BIDS to be opened 3:00 PM, EDT, July 26, 1961, in Room 424, 499 Penn. Ave., N.W.

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5623) will be received at Lewiston, California, until 1 p.m., Pacific Standard Time (2 p.m., Pacific Daylight Savings time) August 1, 1961, for furnishing labor and materials for Trinity-Clear Creek, Clear Creek-Keswick, and Spring Creek-Keswick 230-Kilovolt Transmission Lines, Central Valley Project, California. Location Trinity and Shasta Counties, California. Principal items are 8,270 cu. yds. excavation; 2,695 cu. yds. concrete, 132 towers—erecting steel towers of various types and heights; 37.66 miles of line—stringing conductors of various sizes; and other work. Completion time 450 days. For particulars, address Bureau of Reclamation, P. O. Box 2511, Sacramento 11, California; P. O. Box 247, Lewiston, California; or Building 53, Denver Federal Center, Denver 25, Colorado. Floyd E. Dominy, Commissioner.

CONTRACTORS WATCH THIS SECTION

for New Projects

Publish your announcements thru the "Proposal Section" of Engineering News-Record and get their bids.

ADDRESS BOX NO. REPLIES TO: Box No. Classified Adv. Div. of this publication. Send to office nearest you.
NEW YORK 36: P. O. Box 12
CHICAGO 11: 645 N. Michigan Ave.
SAN FRANCISCO 11: 255 California St.

• POSITIONS VACANT

Structural Engineer-Midwest consulting firm seeks Ph.D. to design complex steel structures, reinforced and prestressed concrete. Preference will be given to applicants with practical experience. Permanent position with established firm in business since 1929. Moving expenses paid. Send resume, including education, experience, and personal qualifications to P-6245. Engineering News-Record.

Estimators — Mech., Elec., Arch., Struct. Expd. estimators to prepare & check change orders on construction work. Openings in various locations in U.S.A. Please send complete resume & salary requirements. All replies confidential. P-6929, Engineering News-Record.

Graduate Civil Engineer. Westchester County, N. Y. office of large firm. Quantity take-off, etc. Permanent position with excellent opportunity. Young man preferred. Experience not necessary. P-6898, Engineering News-Record.

Expressway Design Engineer — Southeast Consulting Firm. Capable of developing design from preliminary to final. Permanent position in expanding firm. Salary commensurate with ability. Send complete resume to P-6903, Engineering News-Record.

Sanitary Engineer with extensive experience in preliminary engineering, detailed design, general overall supervision or client contact on sanitary projects. Submit complete resume of education, experience, and qualifications, together with salary requirements. Stanley Engineering Company: Muscatine, Iowa.

Electrical, Mechanical Engineers—Minimum 5 years experience in grain elevators. Must be college graduate and preferably licensed, capable of handling Electrical and Mechanical Engineering Department for established engineering firm in South. State salary expected, etc. Reply in writing to P-6867, Engineering News-Record.

Electrical Engineer—Estimator—man with experience in electrical estimating particularly in industrial, pole line, and power plant work. Reply to "Estimator" Box 1078, Columbus, Ga.

Mid-west city of 35,000 desires combination Director of Public Utilities and Water Utilities Superintendent. P.E. desirable but not essential. Also requires Electric Utilities Superintendent with line experience. Send complete resume. P-6966, Engineering News-Record.

Civil Engineer or Engineer in Training—able to obtain registration in Ohio. Interest in Expressway and Freeway Planning, design, construction. Starting salary—Engineer up to $7987; Engineer in training up to $6895 depending on experience. Other benefits. Apply: Chief Engineer, Room 531 Municipal Bldg., Dayton 2, Ohio.

Town Engineer, P.E.: Capable of handling wide scope of municipal work and dealing with public. Write relative to background and salary desired, to: Supervisor, 501 South Park Ave., Hamburg, N. Y.

City Engineer—Carson City, Nevada. An Engineer with Municipal experience, desired, but not required. With executive experience preferred. Must have or procure registration in Nevada as a land surveyor and civil engineer. Applications sent to Geraldine Lamb, City Clerk, Carson City, Nevada.

Resident Engineer—Bridges and other heavy construction, must be experienced, good engineering background and bearing, capable of assuming other professional assignments, excellent opportunity, upstate New York, Consultant, send complete resume, all correspondence acknowledged, P-6983, Engineering News-Record.

Electrical Engineer—Large automobile manufacturing firm in Midwest has immediate opening. Require B.S. in Electrical Engineering with industrial plant experience to follow automated machinery installation and plant engineering design including power distribution, lighting, etc. Age range, 25-45. Send complete resume and approximate salary requirement to P-6800, Engineering News-Record.

POSITIONS VACANT

City Engineer—Full-time resident civil engineer, with experience in municipal engineering; streets, water, and sewer work; who will also serve as Zoning and Building official and lend personal interest and professional supervision to Public Works. 3rd Class City—northwestern Penna., 50 miles from Erie. Home of Drake Well. Pop. 8326. Attractive town in beautiful valley. Modern schools, churches, hospital, public library, recreation park, swimming pool, athletic fields; golf courses nearby. Public Water Works and new Sewage Plant. Projects—Urban Renewal, extensive improvements to existing water system, flood control, and soil conservation. Redevelopment Authority actively working with planning consultants and government agencies. A challenge for the right man to participate in the planning and completion of many improvements. A fine place to live, work, and play—with good pay. For further information, contact Dr. C. M. Sonne, Mayor —City Hall—Titusville, Pennsylvania.

Electrical Engineer: $647-$787 (Appointment may be made above entrance salary). Requires graduation with a degree in Electrical Engineering + four years experience in electrical engineering; valid Electrical Engineer's license at time of appointment. 2 vacancies in Carson City (Planning Board and Public Service Comm.). For further information contact State Personnel Department, Heroes Memorial Bldg., Carson City, Nevada.

Mechanical Engineer: $647-$787 (Appointment may be made above entrance salary). Requires graduation with a degree in Mechanical Engineering + four years experience in mechanical engineering; valid Mechanical Engineer's license at time of appointment. Vacancy in Carson City (Planning Board). For further information contact State Personnel Department, Heroes Memorial Bldg., Carson City, Nevada.

City Engineer—in a midwest county seat city of 5,000. Take charge of street and sewer program. Work closely with water department. Must be civil engineer registered in Iowa. Salary open. This is a new position—service has been on consulting basis. Send resume to City Clerk, Charlton, Iowa.

Graduate Civil Engineer—two years minimum experience on highways, drainage or other municipal engineering work. Send complete resume including references, salary requirements and availability. Good opportunity for young engineer. P-6992, Engineering News-Record.

Bridge Superintendent and Project Manager for Ohio bridge and highway construction co. Must be capable of running complete job and willing to travel with work. Send resume including recent photo, and state salary required and availability. P-7011, Engineering News-Record.

Sales Engineer for new product sale and promotion. Experience required. Asphaltic concrete and asphalt sales. Travel. Contact R. E. Hartwig, JM Corp., 22 East 40th Street, New York 16, N. Y.

Staff Engineer asphaltic concrete. Knowledge of mix design, procedures, specifications. Supervise and evaluate new product, field test. Travel. Contact R. E. Hartwig, JM Corp., 22 East 40th Street, New York 16, N. Y.

Soil Mechanics and Foundation Engineering; South African Council for Scientific and Industrial Research: Applications are invited for the post of Head of the Soil Mechanics Division of the National Building Research Institute, Pretoria. Applicants with academic qualifications and experience which would enable them to take over the leadership of a team which has already pioneered research in several aspects of soil mechanics and foundation engineering should write for further information and details of salary, etc. to: South African Scientific Liaison Office, 1907 'K' Street, N.W., Washington 6, D. C.

Estimator for concrete and earthwork take-off for large general contractor Washington, D. C. area. Must be experienced in commercial work. Send complete resume of experience and salary expected to P-7005, Engineering News-Record.

Civil Engineer with excel. scholastic bkgrnd., active military serv. completed, no exp. nec. for estimating position leading to mgmt. Well established NYC & LI Bldg. Contractor. P-7009, Engineering News-Record.

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Civil or Structural Engineer for sales. Top Midwest consulting engineer firm. Minimum of 15 years experience in civil work, water, sewage treatment, highways and bridges. Client contact and sale of engineering services. Send resume in confidence to P-7014, Engineering News-Record.

Estimator for demolition concern to take off quantities from plans and specs—obtain required permits—follow reports and contact owners and general contractors—please send resume and qualifications to: P-7013, Engineering News-Record.

Wanted: Design Engineer—Must be very capable and reliable in detailing, checking and designing structural steel—location, Mid-West. Send complete resume, including references, salary and availability. P-7017, Engineering News-Record.

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Executive, 16 yrs const exp, capable administrator, mgr. atty, efficient coordinator, govt contracts, female. PW-6853, Engineering News-Record.

BSCE, Age 36, Plant Engineer, industrial building construction, structural design, specifications, and architect-engineer liaison. Reg. N.Y.P.E. Seeks promising position in Northeast. PW-6933, Engineering News-Record.

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General Superintendent, Project Manager 37. P.E., 10 years exp. sewers, highways, shopping centers. Good organizer. Any locale. PW-6977, Engineering News-Record.

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Construction Manager, age 39, BSCE, registered. 15 years diverse experience in heavy construction and industrial maintenance. Estimating, scheduling, field layout and job supervision. Seeks permanent position with aggressive medium-sized general contractor. Available November. PW-6895, Engineering News-Record.

(Continued on opposite page)

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P-6998, Engineering News-Record,
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BUCHART-HORN
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POSITIONS WANTED
(Continued from opposite page)

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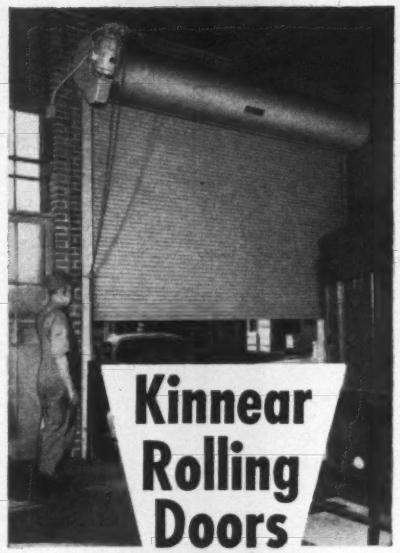

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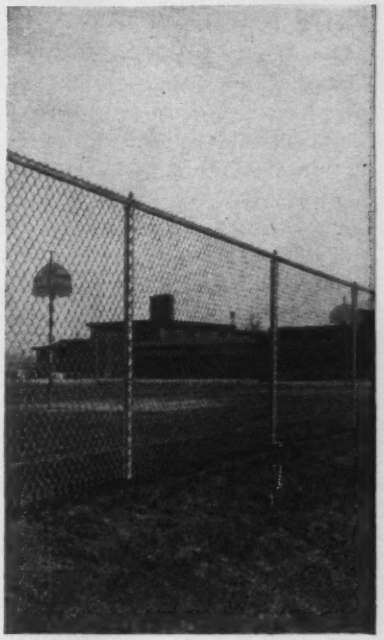

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Editorials

Interstate Agencies on Trial

Appeal of a contempt of Congress conviction hopefully may bring the Supreme Court to rule on the federal government's authority over interstate agencies. Such interpretation is badly needed.

Held in contempt is Austin J. Tobin, executive director of the Port of New York Authority. A Federal District Court convicted him, but stayed execution of the 30-day sentence and $100 fine pending appeal. Mr. Tobin was charged with contempt for having refused to turn over files of the bi-state agency to a congressional inquiry, saying he acted under directions from the governors of New Jersey and New York in his refusal.

The Port Authority will appeal the conviction in a higher court and in the Supreme Court, if necessary. This is good. As an outcome, we hope Mr. Tobin's jail sentence will be reversed, for he was doing what the governors told him to do. But far more important, we hope the Supreme Court will give due attention to the role of all interstate authorities.

Hopefully, the Court will point out that while the federal government's legal blessing is needed before states can beget quasi-governmental agencies to finance, build and operate quasi-public works, such regional entities must not be controlled from Washington.

Hopefully, the Court also will find and stress that the states that create an authority have not alone the right but the duty to regulate its activities.

And hopefully, the Court will remind all such authorities that their existence stems not from their investors, but from the citizens whose representatives created them under the law. Their employees work with the money of private investors as do the employees of any publicly held corporation, but their jobs depend upon acceptance of the public they serve. Their bosses are the elected representatives of that public.

Naming the Baby

If graft is the most odious and serious problem of construction, one of the more odious of the petty problems is picking the name for major structures. Invariably some anxiety-ridden public relations man or civic organization decides that the name that has come naturally to identify the bridge, dam or expressway during construction isn't glamorous enough. He beats the drums for an elaborate, cute, contrived name that no one will use without embarrassment.

The Chamber of Commerce of Norfolk, Va., is trying to produce a name for the Chesapeake Bay Bridge-Tunnel, now under construction. The Chamber's own choice is "Chesapeake Seaway," despite the fact that a seaway is a travel route for ships, not cars, trucks and buses. Other asininities under consideration are: "Virginia Chespan," "Virginia Capeway," "Robert E. Leeway," "Chesapeake Shortway," "Delmarva Peninsula Throughway," "Chesapeake Seaspan" and a variety of cumberson titles honoring local or national figures.

It's not that naming structures for people is wrong; we've commended the honoring of persons living and dead by naming for them the structures to which they have contributed. But it can lead to ridiculous situations. Naming Hoover Dam in 1930 for the President, who had worked for its construction as Commerce Secretary as early as 1922, made sense. But, changing the name to Boulder Dam and then back to Hoover Dam generated so much confusion that it's been suggested the simpler solution would have been for the former President to change his name to Herbert Boulder. And such honors can be overdone. We commended the Power Authority of the State of New York in 1958 when it named the Robert Moses Power Dam on the St. Lawrence after its chairman. But did it have to create a Robert Moses Niagara Power Plant as well?

The official effort to encumber the Narrows Bridge by prefixing the name of a relatively obscure Italian explorer seems doomed to failure. New York officials should have learned when they renamed Sixth Avenue. Very few natives call it the Avenue of the Americas.

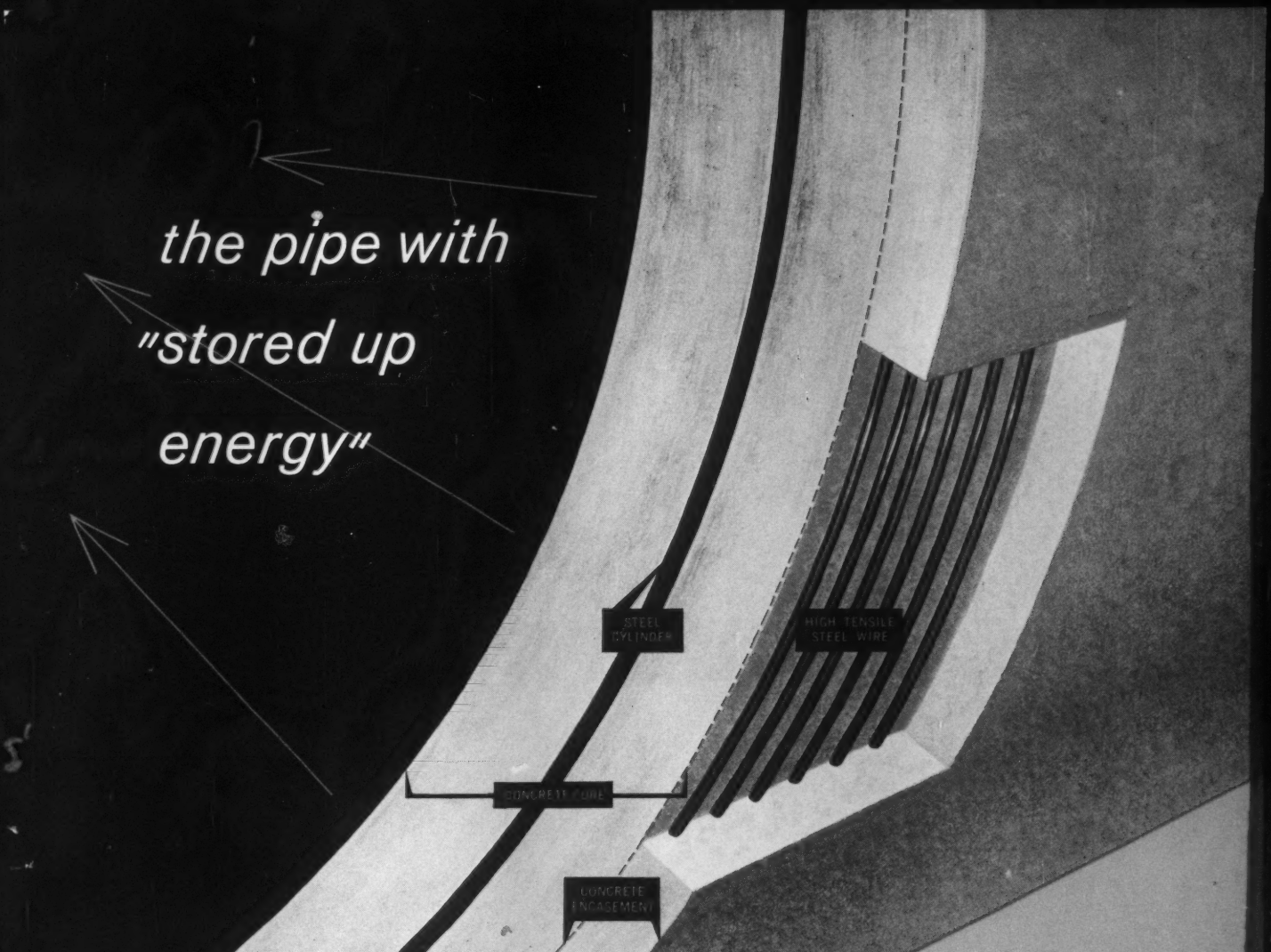
The best names for bridges, dams and other structures are the ones that come naturally for them. These names are invariably straightforward and easy to remember, and they give some idea of location. The best name for the Chesapeake Bay Bridge-Tunnel is "The Chesapeake Bay Bridge-Tunnel."

Forts Fortified

For more than 125 years Fort Wadsworth on Staten Island and Fort Hamilton in Brooklyn have stood guard over the Narrows, portal to New York Harbor. Neither fort has ever fired a shot in anger. Yet, today, the two forts stand more proudly than ever at the Narrows, for the Triborough Bridge and Tunnel Authority is spending $26 million on them to replace buildings in the path of the Narrows Bridge and its approaches. Dilapidated frame buildings are being replaced with fine brick structures (ENR June 29, p. 24) estimated to cost 20 to 50 times the cost of the original buildings.

It is interesting to see that the high cost of right-of-way doesn't come down appreciably when federal property must be taken—particularly when none of the money to purchase it will come from federal coffers. TBTA bondholders and ultimately the users of the bridge will pay. With the federal government's Bureau of Public Roads cracking down on the states' payments for right-of-way, here is the Defense establishment proving that it can drive a pretty good bargain when Uncle Sam has right-of-way to be sold and facilities to be replaced.

the pipe with "stored up energy"



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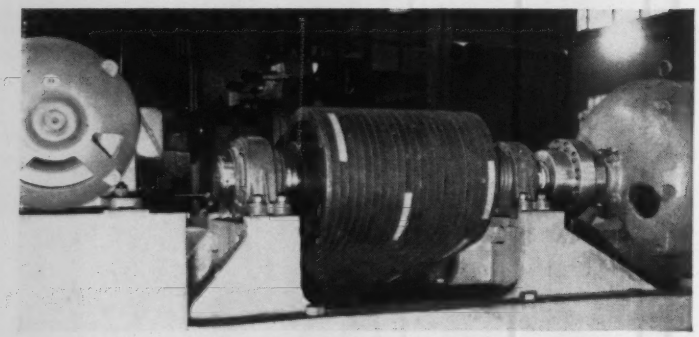
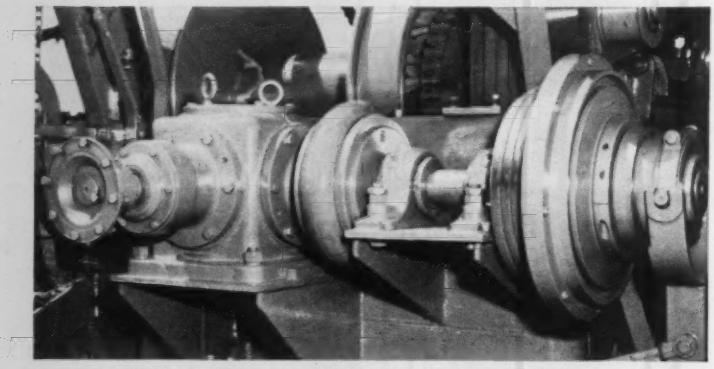
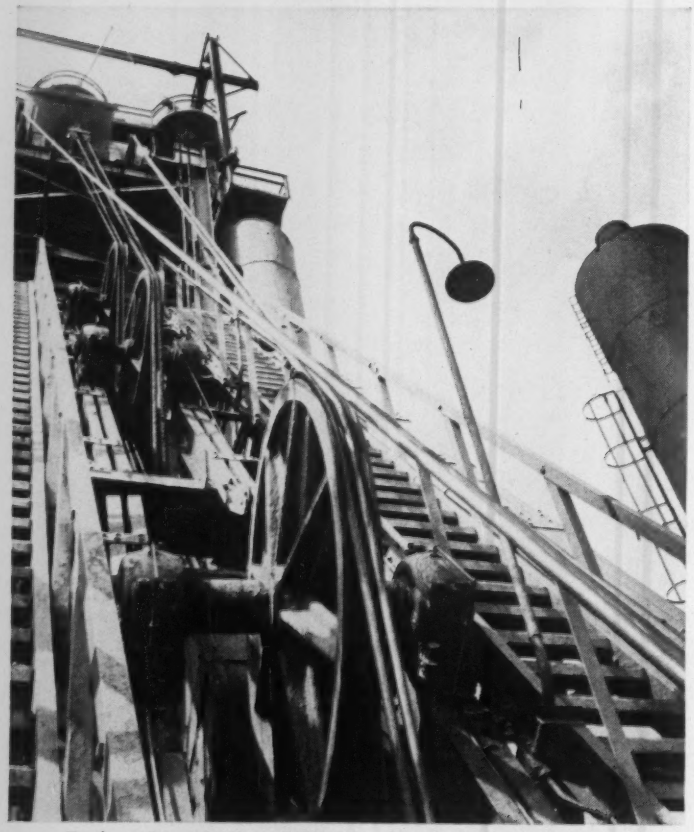


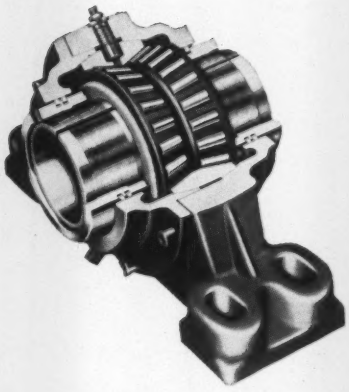
Timken bearing equipped Dodge All-Steel Pillow Blocks used on steel mill hot saw.



Dodge Type "E" Pillow Block with Timken bearings used on drive hookup of a rotary table.



Dodge 7" Special Duty Pillow Blocks with Timken bearings used on skip hoist bull wheel at a steel mill.



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